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The Pharmaceutical Council held its monthly meeting on the 2nd inst., Mr. Williams presiding.—Mr. Henry Ayscough Thompson was chosen to fill the position of auditor, the election being rendered necessary by the election of Mr. Stacey to a seat on the council.—The reports of various committees were read and considered, but they were not of general interest.—Mr. Mackay called attention to the fact that the next council meeting would clash with the session of the Pharmaceutical Conference in Glasgow. He asked if some arrangement could not be made to avoid this difficulty. Mr. Bottle suggested that it might very easily be settled by the simple means of a quorum not presenting itself. It is probable that this course will be arranged.—Mr. Hampson drew attention to a general order recently issued by the Board of Inland Revenue to the effect that the use of methylated spirit was only to be legal in the preparation of soap and compound camphor liniments. This would prevent the use of methylated spirit in the manufacture of aconite and belladonna liniments, which were largely used in hospitals and such institutions. This order, if carried out, would occasion a confiscation of considerable stocks of these liniments, and would be oppressive to the poor, who would be practically precluded from the use of these valuable medicines. He suggested that the president and vice-president of the society should see the Inland Revenue authorities on the subject. Mr. Stacey said he had received a communication from the Board withdrawing the permission, which they had granted him in 1869, to prepare these liniments with methylated spirit. He believed the Board had issued this order in con-

sequence of the very few persons, not more than one or two besides himself, who had applied to them for permission. After some further discussion it was arranged that the president, Mr. Stacey, and the secretary, should wait on the Commissioners of Inland Revenue in reference to this new regulation. Mr. Mackay suggested that chemists would do well to abstain from dealing in the prohibited liniments, at least until the result of the projected interview should be known.—The reports of the professors next came under notice, with the list of prizemen in the School of Pharmacy. It appeared, according to Mr. Greenish, that while 62 candidates had passed their Major examination during the past year, and were consequently eligible to compete for the Pereira Medal, the highest honour the council had to bestow, only 9 had actually presented themselves. In reference to the ordinary examinations Mr. Greenish thought it would be desirable to have periodical reports from the examiners indicating the subjects in which deficiency was generally found. This, however, was said to be not practicable, as when a candidate was found to be hopelessly deficient in any one subject he was generally sent back without continuing his examination through all its stages.—A letter from the secretary of the Birmingham Conference was read, enclosing the resolution passed at that meeting urging on the council the necessity of testing the legality of co-operative societies selling and dispensing poisons. The Bridgwater chemists had also written, pressing the society to use its power to protect the interests of the trade. Mr. Atkins commenced the discussion. He spoke respectfully of the meeting at Birmingham, but he thought two associations were hardly desirable. From his brief experience at the council he was convinced that due consideration was given to every question and every grievance brought before them. Mr. Savage said that an association such as that inaugurated at Birmingham could do much in the way of producing evidence to enable the council to undertake prosecutions. Mr. Hampson interposed with a remark to the effect that they had not to discuss the desirability of a trade organisation, but had simply to consider the resolutions which had been sent to them. Mr. Betty thought otherwise, and he proceeded to criticise some of Mr. Hampson's remarks at Birmingham, which, he said, tended to throw the apple of discord between the council and their constituents. Mr. Hampson replied that in his view the council had not done its duty in reference to co-operative stores, and he said that in two or three months he intended to bring the question forward again. But he said he had been told more than once at that council that it was unwise for them to meddle in almost any trade matter. When such remarks were made members of the trade outside were justified in assuming that the council did not take a really genuine interest in trade matters. Mr. Shaw adduced the instance of the two societies in Liverpool to show that there was room for two associations. Mr. Bottle, Mr. Hanbury, and Mr. Mackay declared that the council had investigated this matter, and the last-named gentleman said that though all of them had been actuated by the strongest desire to put down what they considered illegal trading, yet he thought they had acted wisely in following the advice of their solicitor, backed by the most eminent legal opinion in the country, to the effect that they had better not meddle in this matter. The president wished those gentlemen who were so eloquent at Birmingham would come to the annual meetings of the society and give the society the benefit of their suggestions. Mr. Stacey remarked that he was surprised at this resolution from Birmingham, because it appeared to be something like a vote of censure on the council. He was thoroughly convinced that the council was probing to the bottom the grievance which the Conference had censured them for disregarding. The resolution was then unanimously referred to the Law and Parliamentary Committee.

The *Medical Press and Circular* of August 9 reports that at Ballina petty sessions, a few days ago, a chemist was remanded on the charge of selling tartar emetic for cream of tartar. Five persons were nearly fatally poisoned through the mistake.

The prize we offer for the best essay on Quantivalence, respecting which we announced particulars in our Corner for Students last month, is one of Collins' Five-Guinea Student's Microscopes. We may here repeat that the latest date on which we can receive essays is August 31. Any reaching us after that date will be *hors concours*. The essays should not be very long. An article which would occupy something between one and two pages of this journal appears to us about the necessary length.

Dr. Lewis Feuchtwanger, of New York, died last month, at the age of 70. He was a native of Nuremberg, in Bavaria, and when he was a little over 20 years of age he opened the first German pharmacy in the city of New York. In later life he became eminent in mineralogical studies, and was much consulted by the American government in matters concerning coinage and such-like.

A number of eminent homœopathic physicians are aiming to establish a medical school in connection with their hospital, the object being not to provide a full curriculum, but to supplement that given at other schools by a course of training in homœopathic theory and practice. We regret to notice that these gentlemen threaten to appeal to the public for support. It would seem that if there is not sufficient demand for such instruction to render it self-supporting, the proposal is premature.

The Irish chemists have gained their point against Sir M. Hicks Beach in reference to exemption from jury service. Thanks to the assistance of Mr. Errington, M.P., the Government has included pharmaceutical chemists among the exemptions in the Irish Juries Bill, now on its way through Parliament.

Some members of the Irish Pharmaceutical Council are desirous of forming a deputation to the British Pharmaceutical Conference next month, and it is to be hoped they will carry out that idea. The president and vice-president, however, very properly, as we think, opposed the suggestion that the expenses of such a deputation should be met by the society.

According to an advertisement appearing in this number, the Board of Inland Revenue has lately discovered that a forgery of a large quantity of patent medicine stamps, bearing the words "Dr. J. Collis Browne's Chlorodyue," has been perpetrated. Mr. J. T. Davenport offers a reward of 250*l.* for information that shall lead to the conviction of the offenders.

At the Nottingham Assizes, on July 20, a chemist of Newark, named Wigginton, has had to pay 200*l.* to the daughter of the postmaster in the same town for breach of promise of marriage. He had found her "not good enough," for the reason that she had no fortune.

Messrs. Lea & Perrins, of Worcester, have failed to establish their exclusive right to the title of "Worcestershire" in connection with sausee. In a cause heard on July 26, in the Chancery Division of the High Court of Justice, their bill was dismissed with costs, the Master of the Rolls judging that they had allowed their right to lapse by not using due diligence.

At the Manchester Assizes, on July 22, Mr. Eckersley, chemist, Oldham, recovered 600*l.* from the Manchester, Sheffield and Lincolnshire Railway Company as compensation for injuries received in a collision at Ardwick on February 27, 1875. The brain, spinal cord, and nervous system had been injured, and his business had suffered owing to his enforced absence from his shop.

The Medical Defence Association has been somewhat busy in prosecuting some rather flagrant cases of infringement of the Medical Act. A Mr. Sydney H. Witherington, chemist, of Wandsworth Road, was fined 15*l.* and 2*l.* 18*s.* 6*d.* costs for using the title "Dr." on labels, &c., and having the word surgeon on a lamp over his door. On July 5, W. Walton Spiller, of 189 High Street, Shadwell, was fined 20*l.* at the Thames Police Court for calling himself "Dr. Walton," and having the words "Walton, surgeon," on his door. The defendant said he called himself "venereal surgeon." The magistrate said this was both an admission and an aggravation of the offence. On July 22 another chemist, named T. C. Balls, of 2 Grange Road, Bermondsey, was fined 5*l.* by Mr. Benson at the Southwark Police Court for unlawfully professing to be a surgeon.

Professor Wanklyn, following up his experiments on the action of silicated carbon on organic matter, reports in the *Chemical News*, of July 21, a very remarkable experiment. He dissolved some strychnine in water in the proportion of 8·841 grains to the gallon. Without the alkaloid the water tested by the ammonia process yielded 0·05 mgrm. of albumenoid ammonia per litre. With the strychnine in solution it yielded 5·20 mgrms. to the litre. Ten litres were passed through a filter which had previously been used with solutions of quinine and morphia. The first five litres were thrown away. On testing what passed through afterwards by the ammonia process the liquid yielded some free ammonia and 0·04 mgrm. of albumenoid ammonia, showing that the filtrate was devoid of strychnine. Before filtration the liquid was distinctly bitter; afterwards it had no bitter taste. Mr. Wanklyn says he was confident enough of the exactness of his results to risk his life on them, so he drank 300 c.c. of the liquid, a quantity which before filtration would have contained 40 mgrms. of strychnine, without tasting any bitterness, or experiencing any injurious effects.

A very important decision has been given by the Master of the Rolls in reference to trade marks. Mr. Henry Stevens, of Aldersgate Street, wished to use the word "Aeilyton" as a trade mark for certain inks manufactured by him. The Registrar refused to allow this, on the ground that the Act did not recognise mere words unless they had been in use as trade marks before the passing of the Act. Mr. Stephens appealed according to the Act to the Court of Chancery, but the Master of the Rolls supported the view taken by the Registrar. The plaintiff's counsel argued that the word so used was to be regarded as a "device," and he quoted Longfellow's reference to the word "Excelsior" as "a strange device" in support of his argument. Mr. Stephens has written to the *Times* pointing out that under this decision such trade marks as "Eureka," as applied to shirts; "Excelsior," as applied to soap; "Anatolia," as applied to balm; and "Glenfield," as applied to starch, will not be eligible. Another decision lately given is to the effect that a trade mark on which the word "registered" appears is not to be allowed.

The Chemists' Trade Association will hold a meeting at Glasgow on September 8, following the meetings of the British Pharmaceutical Conference to be held on the 5th and 6th of that month.

On the 7th inst. Sir Wm. Frazer gave notice in the House of Commons that early next session he would move for leave to bring in a bill to amend the law relating to the sale of poisons and poisonous substances.

A very valuable contribution to the art of butter analysis has been lately published by Mr. Bell, the principal of the Somerset House laboratory. He separates the butter fat from the water, salt, and curd, and then takes its specific gravity at 100° F. This he finds to range between 910 and 913. All other animal

fats under like circumstances show a much lower specific gravity, varying from 902 to 905. This method is particularly advantageous on account of its simplicity and certainty. He shows that the results correspond invariably with those obtained by the much more complicated process of estimating the fatty acids according to the system of Angell and Hhner. By other experiments Mr. Bell is led to the conclusion that butter fat is not a mere mixture of glycerides, but is probably a complex compound, *sui generis*. An artificial mixture made to correspond with butter in regard to specific gravity and chemical composition could easily be separated into its constituent glycerides, but true butter cannot be so treated.

Pharmatalia.

Much may be said in favour of the desirableness of not becoming famous; at all events there is some advantage and more consolation in keeping the even tenor of one's way.

The unambitious pharmacist may safely wend his course across the *via media* with no other fears than those caused by a doubting customer on the one hand, and a sensation analyst on the other. On him no deputation waits with a testimonial, and no associated sympathetic guineas vote him an address.

Let either distinction overtake him, and henceforth he is a doomed man. Society has marked him for her own. From that moment the mildest public dinner means a speech from the "talented and distinguished;" and even when tempted to take refuge amongst the scientific apparatus of a *conversazione*, he is pointed out to the fair pharmacienncs as Blank—"You recollect Blank, my love, who wrote the prize essay on Quantivalence."

An additional motive not to covet popularity may be drawn from a fear of being one day included in the Fine Arts collection now on view at Bloomsbury Square. There was an estimable man called Henry Deane: a hard-working chemist, a good botanist, and an efficient worker with the microscope. What fault had he committed that he should be displayed in perpetual penitence to the gaze of our members and associates? Why should the fine head of Mr. Morson, with its keen intelligence, the bright eye and suggestive activity, be handed down to posterity with features yellow, though not with age, and placid without character?

We must tell our young men that these twin Poonah paintings do not bring back to our recollection either the patriarch of Clapham, or the noted manufacturer of British chemicals. Higher in the scale of art is the portrait of Mr. Sandford, by John Prescott Knight. No one has better deserved to be held in esteem by his contemporaries than the gentleman who so often presided over the counsels of the society. His was a hard contest in defence of the political life of pharmacy, and he came out of the strife successful.

We are far from being altogether dissatisfied with this exhibition of the artist's skill, but we do not *like* the result. The blue tints may, and probably will, tone down in time, and then a more favourable opinion may be recorded. Passing by Landseer's representation of the late Jacob Bell, which is somewhat removed from the pale of criticism, we may turn to a more encouraging aspect of commemorative art. The most recent contribution to the society's collection is the portrait of the late Daniel Hanbury, by Mr. Arthur Stocks. Great difficulties were felt in the execution of this work. The artist had no personal acquaintance with the deceased pharmacologist, and had not the advantage of having met him in public. Hanbury is represented in a sitting posture, and listening to an imaginary speaker. He is meant to be in a double sense *in the chair*. The attitude is good—so is the expression, and the colouring is admirable.

Place the canvas in a slanting direction so as to leave the

one too prominent feature in the shade, and a striking and satisfactory resemblance to the original is produced.

Nobly conspicuous amongst the rest hangs the portrait of the society's first president, the late William Allen. Before this excellent study we should be content to linger, did not other subjects claim attention.

The Trade Conference at Birmingham has been successfully inaugurated: the movement has been supported by sufficient numbers to afford ground for hope.

One stumbling-block was the very circumstance of its commencement—the proposal of the new organisation emanated from a private firm. Clearly the initiative must come from somewhere, and even the larger creation of the Pharmaceutical Society hailed from an establishment in Oxford Street.

The projector of the Trade Conference, William Southall, stands above any suspicion of seeking to advance his own interests. Personally unassuming, he is one of the most conscientious of our examiners, and he has written a small book on the Organic Materia Medica of the British Pharmacopœia, which is a gem in the style of printing and in contained information.

Richard Reynolds, the first chosen president, has the gift of cautious daring; and, lastly, the Conference is a want and not an agitation. We have to congratulate the members on their opening proceedings. The papers read were short and the discussions shorter: both seemed very much to the point.

While trade is thus wisely standing on the defensive, literature has not been forgotten by our fraternity.

Dr. Tilden, formerly engaged at the School of Pharmacy, and now a Professor of Chemistry at Clifton, has brought out an introduction to the study of chemical philosophy. We were tempted to exclaim, What dextrous shake of the kaleidoscope can arrange elementary science teaching in a new shape? Of text-books we have had enough, and *manual* labour seems to be exhausted.

Such forebodings were agreeably disappointed, and the work in question has met with high praise outside pharmaceutical circles. Dr. Tilden had already won his spurs. He was known as an accomplished teacher, and it must be remembered to his honour that, while yet an official demonstrator at the Square, he ventured to present himself to the ordeal of the regular examination. He made his mark in his aloin researches, and contributed not only consecutive papers of importance on the chemical equations of the Pharmacopœia, but was the writer of many readable articles, specially one on Scheele and his discoveries.

This Introduction is designed to offer philosophic views of chemistry as a whole, and not as an isolated branch of study. We entirely share the opinion of the *Athenæum*, July 22, 1876, that the author "has throughout displayed much originality in the treatment of his subject, and has succeeded in producing a little manual which, to the thoughtful student, who has already made some progress in modern chemistry, must assuredly prove a treasury of information not readily accessible elsewhere."

Messrs. Macmillan have issued the collected *Sciento Papers* of the late Daniel Hanbury. The publication of the series was delayed in consequence of the difficulty of printing the author's revised copy of his "Notes on Chinese Materia Medica." The blocks for the engravings had been lent to Professor Martius, and arrived too late for use. The whole of the illustrations of this section, and many others, were reproduced from the original impressions by the zincophotographic process of Messrs. Leitch. The same process was employed in the autograph *facsimile* of one of the author's letters. Most of the larger plates are the work of Mr. Cooper: the remainder were lent by the Pharmaceutical Society.

One of the most refreshing items to be included in the *Pharmatalia* of the month is Professor Attfield's report of the number and progress of his students. One hundred

and twenty-three pupils have attended during the session, "the highest number by ten that have ever worked in the laboratory since the establishment of the school." We entirely disagree with the idea subsequently expressed by the Doctor, that the results of the weekly examinations should be taken into account in determining the position of the candidates for the Council prizes, though we quite see and sympathise with the notion from a professorial point of view. As regards the students, we think it unwise that they should experience so prolonged and continuous a strain. Practically speaking, we believe that the effect on many sensitive minds of feeling that success or failure was influenced by every recorded effort throughout the session would be disheartening, and would act injuriously on certain temperaments. We are convinced from personal experience of two things—first, that the institution of these frequent examinations is an unmixed advantage; they rob the final contest of its imaginary terrors—they are famous discipline and preparation, both stimulative and instructive. Secondly, that to leave them free of permanent results which may affect the student's ultimate interest is a good and salutary thing.

A strong word of praise is due in behalf of Henry George Greenish—the triple silver medallist of the school. May his first honours be the omen of success in future. His father must not deplore the present scarcity of candidates who enter for the Pereira medal. Sixty-two, it appears, were eligible to compete; nine only put in an appearance. The president, Mr. Williams, in our humble judgment gave the true explanation. Students are not for ever in their war paint, and examination knowledge oozes most unpleasantly by lapse of time. It is obvious that candidates fresh from their other honours, and in full training, would have an advantage over those whom business and various pursuits had led into other channels of application. The system under which the award is assigned seems to want revision, though Mr. Hills, in consideration of the many changes already introduced, naturally deprecates further alteration.

Mr. John Mackay, whom we have reason to believe is Scotch, reminded the council that the Pharmaceutical Conference was to be held this year at Glasgow. He has made the bold proposal that it would be better to listen to Professor Redwood, and admire the stained glass windows of the cathedral, than to attend a General Purposes Committee, or discuss co-operative iniquities in London. The beauties of the Clyde and the admirable after-dinner speech of our northern representative will doubtless prove strong attractions.

We may be prepared, then, to see the whole body of those who conduct our public pharmaceutical affairs bound for a distant shore; and our revered secretary himself, released from official cares, listening with appreciation to the national instrument of Caledonia.

Autumn is the season for holiday—September the month when the much-enduring pharmacist takes his well-earned annual relaxation. Time was (we remember well the period) when a fortnight every other year was the permitted interval of cessation from the onerous duties of the druggist. We have seen the old regulations mitigated without a shadow of regret, nor do we imagine that the strictest business requirements have suffered from a more liberal arrangement.

Presidents mostly go to Switzerland, and editors to Paris; minor characters escape as far as the Surrey Hills, while others are content with Margate. Between the two poles of enjoyment—the Alps or the Hall by the Sea—may be gained a vast amount of happiness and renovated strength.

We have no wish to moralise upon the occasion, nor to bid the tourist to improve his mind. We say on the contrary—leave books for a space alone, and let science rest. Try the rotation of the crops, and let seeds ripen other than those found indexed

in a manual. Or if the daily labour has been, as it often is, too arduous, then try doing nothing, and let intellect go fallow.

There is no danger in our ranks of too great a leaning towards dissipation, and the severest critic will be ready to forgive a slight departure from the path of industry.

MR. S. U. JONES,
PRESIDENT OF THE CHEMISTS' AND DRUGGISTS' TRADE
ASSOCIATION.

IT was our duty last month, in reporting the Trade Conference at Birmingham, to announce the election of Mr. Samuel Urwick Jones, of Leamington, to the presidency of the Trade Association formed on that occasion. We have no doubt that those chemists and druggists who were not present then, and who have not had another opportunity of making themselves acquainted with their new leader, will be glad to be introduced to him by means of the portrait which accompanies this sketch.

This is not the time to write any eulogy on Mr. Jones. We hope to have that pleasure on a future occasion, when we see him at the head of a compact, resolute, and truly representative body of the British chemists and druggists. If he succeeds in focussing the now scattered pharmaceutical power of this country, and thus preparing the trade to meet the attacks which threaten and helping them to secure their fair rights, he will deserve the hearty thanks of this and future generations of chemists and druggists. This means some very hard work, however, and a good deal of tact. A section of the Pharmaceutical Council, we are sorry to see, has already manifested a most unworthy jealousy of the new association. Unless that spirit be at once abandoned the council will be open to the charge of bad faith in this matter. But if they, as a body, choose to adopt an obstructive policy we can only say, so much the worse for them. There is a good sprinkling of chemists throughout the country who are quite in earnest in their demand for some trade action. The council has most clearly shown that it is either unable or unwilling (perhaps rightly so) to undertake this kind of business, and it seems to us most ungenerous on their part to take the initiative in any attempt to frustrate the attempt so energetically, and we will add so amicably, commenced by the trade itself. We do not think their co-operation is essential, but we are sorry to see any attempt to divide the force which will be so much needed.

We are aware that the selection of the president caused some disappointment. Many chemists had hoped that either Mr. Barclay or Mr. Reynolds would have accepted the post for the first year. The splendid organising abilities of these gentlemen had been so abundantly proved that great confidence in the success of the new society was felt in the event of their leadership. It is, however, on their recommendation partially that Mr. Jones was chosen. He is thoroughly acquainted with the requirements of the trade, having been in business in Leamington over 30 years. He has also a high local reputation. In Leamington he was chairman of the Board of Health for three years, during which period he conducted, to the great satisfaction of the town, some very laborious arrangements for the disposal of the sewage.

Mr. Jones is a native of Ludlow, where he served his apprenticeship. He gained experience in London at the establishments of Keating and Dinneford, and he has since taken part in the work both of the Pharmaceutical Society and of the Pharmaceutical Conference.

It is for the chemists themselves to decide whether they will support him heartily and loyally. If they do not, failure in the accomplishment of any of the objects in view will be their disgrace, and not his.

THE CHEMIST AND DRUGGIST PORTRAIT GALLERY.

XXII.



MR. SAMUEL URWICK JONES,

PRESIDENT OF THE CHEMISTS' AND DRUGGISTS' TRADE ASSOCIATION.

THE INTERNATIONAL EXHIBITION AT
PHILADELPHIA.
(FROM OUR SPECIAL CORRESPONDENT.)

PHILADELPHIA, July 25, 1876.

THE exceptionally hot weather during the past month has materially diminished the attendance, for the time being, at the exhibition, but with the return of a more seasonable temperature comes a renewal of interest, and such a large increase in the daily admissions that the managers feel now quite secure.

The effects of the heat upon some of the exhibited articles may be distinctly noticed by even those who are usually quite unobserving. The paraffin candle and wax interests have generally suffered severely, a number of tall altar candles, 5 feet high, gradually bowed their heads until they bent double, in obedience to the mandates of the powerful "old Sol," as he is called, whilst one or two declined to make so humble an obeisance, and the result here is even more ludicrous, for they have assumed a sort of spiral twist, which suggests a severe case of curvature of the spine.

A beautiful allegorical figure of America, in paraffin, succumbed, and we had thus a terrible warning to those members of the fair sex who are repeatedly assuring their friends that they are "about melted," for all that was left of this fine lady one morning was said to be a "large grease spot."

Chemical and pharmaceutical preparations have also been somewhat affected. The chloral of Torchon has melted somewhat, but the little damage here has been amply compensated by a beautiful crystalline sublimation of the melted chloral; the appearance of the scale preparations, citrate of iron and quinia noticeably, is ruined, the masses solidifying, or altogether losing their brilliancy. Suppositories, in many cases, fared badly, fusing together in the boxes, and dropping the melted cacao butter upon goods below; and this has been a test in a degree for them, as the temperature has been as high as 103°, and all suppositories not melting at this could reasonably be rated as not serving the purpose for which they were intended, and the presence of wax suspected.

Apropos of the weather, the Medical Bureau has been quite busy attending to cases of *coup de soleil*, and the many less alarming cases of prostration, &c., arising from indiscretion. This institution is rather a new feature at exhibitions; a handsome and commodious building, in the middle of the grounds, delightfully situated on the banks of a stream, has been fitted up with various medical and surgical appliances. It comprises a hospital, furnished with ten or fifteen beds for the severe cases, and a dispensary for minor ailments. A full corps of physicians is constantly in attendance, and four of the principal firms of Philadelphia—Powers & Weightman, Rosengarten & Sons, Bullock & Cronshaw, and Hance Brothers & White have each fitted up cases gratuitously in the dispensary filled with chemical and medicinal preparations, which are used by the physicians, and dispensed freely as needed. Two ambulances are always kept ready for service at the door, to fly to any part of the ground on receipt of a telegram commanding the service. So far no deaths have occurred, and little sickness except that caused by the heat. This is rather remarkable considering that the attendance thus far amounts to 1,500,000 persons, and it may afford some comfort to those who expect to visit the Exhibition to know that if they should be taken sick at the time their wants would receive careful and skilful attention, and withal without any expense to them.

Taking up now the detailed account of exhibits in order, the United States display comes next. As expected, on account of its geographical position, it is the most extensive of any in the chemical and pharmaceutical line. The immenso variety of products, the beautiful crystalline forms assumed by the various substances, and the facilities for display afforded by rows of brilliant bottles, have undoubtedly contributed largely as inducements to manufacturers of chemicals to enter their goods for competition. Abundant reason exists for the bulky displays of heavy chemicals here, which dwarf by their massiveness the foreign exhibits; for in addition to the cost of freight, which in the present depressed condition of trade all over the world would be a serious drawback, the protective tariff proves to be a *bête noire* of more formidable proportions by ruining the foreign exhibitor's chances of any pecuniary return from his outlay in exhibiting his goods.

One of the most interesting of this class (taken altogether) is the collection shown by the Pennsylvania Salt Manufacturing

Company. This company exhibit cryolite, bicarbonate of soda in powder, lumps, and pseudomorphic crystals, carbonate of soda, alum, porous alum, &c. The source of their products is cryolite, the mineral which is brought in large quantities from Ivigtut, Greenland, this company working the mines there in connection with the Danish Government, each sharing equally in the product. After being transported to Philadelphia, it is reshipped by rail to Natrona, Pa., about 300 miles off, where it is worked up. The journey cannot be much less than 3,500 miles. Cryolite, as is probably known by your readers, is a native fluoride of sodium and aluminium $6\text{NaF} \cdot \text{Al}_2\text{F}_6$, and it is found so pure, and the method of separation of its valuable constituents is so devoid of difficulties, that it can be profitably worked even at this distance.

The large lump of alum, probably weighing five or six tons, exhibited by this company is an unique affair. It has been crystallised in a parallelogram-shaped vessel; one of the ends has been sawed out, and this replaced by a sheet of plate glass of the same size; an opening in the top, covered by glass, admits light.

The bottom of this alum cave is studded with individual crystals, capped with their characteristic octohedral summits, and from the top depends a goodly crop, similar in form, the whole forcibly reminding one of the stalactite and stalagmitic formations common in caves. When the whole is brilliantly illuminated, the effect is very striking. Large masses of cryolite are also shown, together with some ethnological contributions.

Immediately opposite this display, Charles Lennig & Co., of Philadelphia, show heavy chemicals. Here also is to be seen an immense cake of alum, and in addition are seen two large monuments made out of alum. They have the form of obelisks, and are probably 20 feet high. Acetate of soda, beautifully crystallised, nitrate of lead, acetate of copper, and a fine specimen of brown sugar of lead, used by dyers, is exhibited.

Savage, Keyser & Stovell, of Frankford, have rather a novel way of showing their specialty oil of vitriol. They have a series of tall glass jars (arranged on suitable shelves), which are nearly filled with oil of vitriol, and floating in each jar is a hydrometer, to observe the specific gravity and strength of the liquid; of course, during the present hot weather they do not show to such advantage as they would otherwise, as no thermometer was attached to show temperature, or other means at hand to make the proper allowance. Daniel H. Gray, of New York, has sulphur in its various forms to show, and the crystallised sulphur is well worth noticing. L. Feuchtwanger & Co., of New York, have manganese ore, &c.

The crucible manufacturers make a prominent display. Robert Taylor & Co., of Philadelphia, have some remarkably beautiful specimens of graphite in crystalline foliated masses, and, of course, all the various forms and sizes of black lead crucibles, also old crucibles that have been through the fiery furnace; a label on one states that it has held 585 lbs. of melted steel, and has been filled and heated eight times without injury. Another has withstood forty heats of brouze, and so on, some having even a better record than this.

The Phoenix Manufacturing Co., of Taunton, Mass.; Wile, Seidel & Co., Philadelphia; and Jersey City Crucible Co., have also full exhibits.

H. J. Baker & Bro., of New York, show their brilliant A.A. castor oil, which seems to have the market here when wanted for internal administration. In their case may also be seen Epsom salt, the most beautiful crystals of saltpetre in the whole exhibition, borax in crystals, camphor in cakes.

R. B. Brown & Co., of St. Louis, Mo., have a good exhibition of their brilliant castor oil. It has been noticed, by the way, by old pharmacists here, that the castor oil of the present day is not as effective as of old, and larger doses (proportionally) have to be taken. It is hardly possible that adulteration in this is carried to any great extent, for the fraud would be easily detected, and some doubts have arisen as to whether there is a difference in the beans furnished by the plants. The same fact may have been noticed by our English brethren—it would, at least, be an important subject to settle.

The glycerine interests are well represented. Henry Bowor, of Philadelphia, who has been in the way of carrying off all of the premiums lately (the Vienna medal included), of course is on hand. Here we see his pure glycerine in elegantly cut-glass jars, and in bottles as found in the market. The by-products are artistically displayed. A figure of Atlas supporting the world, cast out of stearic acid, surmounts the whole, and oleic

acid is shown in glass jars. Prussiate of potassa and sulphate of ammonia are also manufactured by him.

Hartmann, Laist & Co., of Cincinnati, Ohio, are making glycerine of excellent quality, and they make a handsome display of it. They claim superiority, particularly for density in connection with purity.

I omitted to notice in one of my former letters a feature of Price's Patent Candle Co.'s display which has been greatly admired, and is besides of considerable practical and scientific interest. Their show-case is bordered by a series of photographs, enclosed in glass, illustrating the different forms assumed by certain mixtures of the fat acids, when crystallised on glass plates. These combinations are distinctive, and may possibly be of use in detecting adulterations. Stearic with palmitic, stearic with stearine, palmitic with soft paraffin, palmitic with Hungarian wax, were noticed as some of the mixtures. Considerable amusement and satisfaction is afforded the Yankee visitor on observing some of the candles displayed by an English firm ; they are gaudily decorated with the stars and stripes, and whilst the hot weather has noticeably weakened the backs of their surrounding companions and caused them to droop, the patriotic illuminations obstinately remain inflexible.

E. F. Houghton & Co., of Philadelphia, have a striking display of their specialty, cosmoline ; this substance, almost identical with the vaseline recently brought to the notice of English chemists, is now largely used ; it undoubtedly has a place amongst therapeutical and pharmaceutical agents, but should be divested of the attributes of a nostrum if it is to come into general use. The method of manufacture is now well known to consist simply of a purifying of the residue remaining in the stills, after distilling petroleum ; this is done by passing the melted residue through animal charcoal contained in large cylinders kept heated at such a temperature as to retain it in liquid form.

R. A. Chesebrough, of New York, has vaseline to show, of which he claims to be proprietor. Close by the above goods may be seen a very interesting series of chemical products made by Page, Kidder & Co., of New York. Unlike most of the American exhibitors who have aimed at making a favourable impression by displaying their goods in extravagantly-cut bottles, and surrounding them with plate glass and elaborately carved cabinet-work, this house has contented itself with a much plainer outfit ; but, nevertheless, answering all useful purposes. They have in all seventy-five specimens of products, mostly derived from coal tar, some of which are new, and exhibited here for the first time. Some of the most prominent are salicylaldehyde, acenaphthene pyridine (liquid), picoline (liquid), cymene, styrolene, leucaniline, benzamide, cresol carbolic acid, and its derivatives.

The Silliman Chemical Works of Philadelphia have an extensive display of aniline colours—anthracene, rosolate of lime, and other coal tar products. This concern has but recently commenced operations.

Alexander Fries & Bros., of New York, have on hand oleo margarin, the substitute for butter, in which some citizens in our large cities have been foolish enough to invest. This is made from a purified animal fat, coloured and flavoured with a little spring-house milk. In fact, this house seems to delight in displaying with all the effect that can be commanded the greatest variety of liquids, essences, ethers, oils, &c., used in adulterating and in the manufacture of fictitious liquors. Some of their labels read as follows :—Holland gin essence, Jamaica rum essence, blackberry brandy essence, whisky essence, peach brandy essence, old tom gin essence, formic acid, lactic acid, carbamid, glacial acetic acid, malic acid, arrac punch essence, nitric ether, Havana cigar flavour, &c., the whole forming one of the strongest practical arguments in favour of total abstinence there is here.

The essential oil interests are represented ; most prominently, of course, is the oil of peppermint. H. G. Hotelkiss, Lyons, Wayne Co., New York, have not only fine specimens of the oil which has made their name well-known abroad, but oil of spearmint, wintergreen, sassafras, wormwood, tanzy and cloves.

Hale & Parshall, from the same place, have oil of peppermint to exhibit, and also Albert M. Todd, Nottawa, St. Joseph's Co., Michigan.

A great deal of space is occupied by the makers of perfumes, soaps, toilet powders, &c. To the eye of the critic it hardly looks just to award much credit to the exhibitors of the perfumes, as by far the greater majority of them are not extracts distilled by the firm themselves, but have been made

in France at the celebrated flower farms, bottled here, or probably mixed with some few essential oils, which generally has the effect of spoiling, rather than benefiting them, the original distiller should have the praise, where it is due. Soaps and toilet powders are largely made here, and of excellent quality.

R. & G. A. Wright & Co., of Philadelphia, have an extensive display of soaps, pomades, perfume, &c. Weeks & Potter, of Boston, have eight cakes of ambergris, weighing probably twenty-five pounds, in a handsome glass case, on exhibition. Lundborg & Co., of New York, have an elaborately decorated pavilion ; red and gold are the prevailing tints thereto, and the estimated cost \$10,000. A silver fountain (presided over by three nymphs, who sell their perfumes) is furnished with sprays, at which the fatigued traveller may lave his hands with their Jockey Club, White Rose, and New Mown Hay odours without additional expense.

Lorenz, of Toledo, Ohio, C. B. Woodworth & Son, Rochester, N.Y., Arthur Fricke, Philadelphia, R. H. Watson, agent for De Vie & Co., C. R. Taylor & Co., Philadelphia, E. W. Hoyt & Co., of Lowell, Mass., Colgate & Co., New York, Wenck & Co., of N.Y., all exhibit perfumery at a respectful distance. A. W. Dodd & Co., of Gloucester, Mass., show cod liver oil of American manufacture, and not far off is to be seen a similar display made by John C. Baker, of Philadelphia.

I have reserved for my next letter a description of the fine American chemicals.

PHOSPHATE OF IRON AND ITS SYRUPS.

(WRITTEN EXPRESSLY FOR "THE CHEMIST AND DRUGGIST.")

NO^TWITHSTANDING all that has been said and written of late (including all the suggestions and improvements) regarding the various preparations of phosphate of iron, it must still be confessed that there is much about each and all of them exceedingly unsatisfactory, if not decidedly objectionable. No preparation can be considered otherwise than objectionable which is subject to the same amount of variation in strength, general appearance, taste, and doubtless also in therapeutical effect, such as are found in these preparations, and the only wonder is that they have gained and still retain their popular hold alike on the professional and public mind. Their popularity, indeed, so far from lessening, seems day by day to be increasing, and any suggestions, therefore, which tend in the direction of improvement, even although they be, like so many of their predecessors, only empirical in their character, will doubtless be received with satisfaction and attention. The experiences contained in the present paper were derived from a long series of experiments undertaken for the express purpose of determining the relative values of the Pharmacopœia process for the official preparations of phosphate of iron, with that of the process (immediately to be described) contained in the French Codex, and they bring out several features in the former which, though incidentally touched upon by one or two writers lately, it is to be feared are but partially known, and their importance, in consequence, insufficiently appreciated. The official formula, it will be remembered, differs somewhat from the older though unaccepted formula, in respect that it directs a certain proportion of acetate of soda to be employed in conjunction with a smaller proportion than formerly of the phosphate, the idea being to prevent the formation of free sulphuric acid by liberating free acetic acid instead, the latter, it being understood, having a less prejudicial effect on the ferrous salt than the former. That the official process, however, is not superior to the old may be doubted, whilst in certain respects it must be considered open to grave objections. For example—prepare the solutions as directed in the Pharmacopœia for ferrous phosphate, mix, filter, wash, and finally estimate the actual yield of precipitate, and it will be found that not much over half (from 50 to 55 per cent.) the theoretical proportion has been recovered. Next take and set aside the filtrate from this precipitate for a few hours, and it will be found that a second precipitate will be formed, which will yield from 15 to 25 per cent. of ferrous salt, but which by proper means may ultimately be increased to from 30 to 35 per cent. of the actual theoretical yield. Nor is the formation of this second precipitate due to hasty filtration of the first, for although the two solutions of soda and iron be allowed to stand for several hours under repeated agitation previous to filtration, the second precipitate will still form in the filtrate, and nearly

to the same extent. Now, so far as the dried phosphate of iron is concerned, this loss of precipitate in the course of preparation is immaterial. It is a loss, certainly, to the manufacturer, but it does not in any way militate against the quality of the phosphate actually recovered. With the syrup, however, the case is entirely different, for the loss of any precipitate, from whatever cause, directly impoverishes it of ferrous salt, and it is by it so much the more an unsatisfactory and unreliable preparation.

Again, the Pharmacopœia proportion of sulphate of iron and soda salts for the syrup, it will be kept in mind, make not the smallest allowance for loss of ferrous phosphate even by oxidation in washing, far less for any loss such as we have here described in precipitation, a simple calculation showing that they only yield theoretically the exact quantity of salt to make up the standard strength of one grain to one fluid drachm of syrup. Repeated experiments have, however, proved that the loss by oxidation alone in washing the precipitate, even under the most favourable circumstances and careful manipulation, will amount to from 10 to 15 per cent. of the actual yield, and the least carelessness will certainly make this percentage much higher. In the case of the officinal dried phosphate of iron loss by oxidation in washing and drying is allowed to the extent of 55 per cent., and experiment has sufficiently demonstrated that this percentage is not too high a standard for the great majority of commercial phosphates. Why the Pharmacopœia should, therefore, overlook the oxidation which must of necessity take place in the preparation of the precipitate for the syrup, and direct that each fluid drachm shall contain one grain of ferrous phosphate, whilst the formula can by no possibility yield this quantity, is not a little curious. These defects are merely pointed out to show that the Pharmacopœia process is not so perfect as is generally supposed, and that however faithfully the formula for the syrup be adhered to a preparation can never be obtained regarding which it would be safe to affirm that it contained much over half the standard strength of ferrous salt. The same may be said also of all the other non-official syrups made by a similar process, and therefore any formula, simple in its character, easy of manipulation, and, moreover, which does not contain within itself the elements of mischief—if the expression may be allowed—such as are combined in the free sulphuric acid of the old process, the free acetic acid of the official process, or the free carbonic acid in other recommended processes, must commend itself to all, and probably, ere long, be generally accepted. Such is to be found in the formula of the French Codex for phosphate of iron, of which the following is a copy:—

"*CODEX MEDICAMENTARIUS*," PAGE 216.

108.—*Phosphate Ferroso-ferrique.*
Phosphate de fer.

	Grammes.
Crystallised sulphate of iron	100
phosphate of soda	300
Distilled water	3,000

Dissolve each of the salts separately in one half of the water; put the solution of sulphate of iron into a large vase, and pour into it by degrees the solution of phosphate of soda till it ceases to cause a precipitate. Then agitate the mixture briskly, and let it stand for twenty-four hours. The precipitate, at first white and gelatinous, will at the end of this time have assumed a greyish blue tint and a pulverulent appearance. Decant the supernatant liquid, and replace it with distilled water, and continue the same treatment till the washings cease to give a precipitate with chloride of barium mixed with hydrochloric acid, &c.

The difference between this formula and the British Pharmacopœia, it will at once be noticed, consists in the addition of a large excess of phosphate of soda (without acetate) to the iron solution, and the use of a much larger (nearly double) quantity of water in effecting the solution previous to mixing the iron and soda salts. In using excess of phosphate of soda to decompose the sulphate of iron, the reaction seems to be that instead of free sulphuric acid being formed, as is the case when a smaller quantity of phosphate is employed, metaphosphate of sodium (NaPO_3) is formed, a salt not only harmless, so far as the ferrous phosphate is concerned, but exceedingly soluble, and therefore readily got quit of by washing. In practice it will be found almost impossible to adhere literally to the instruction of the Codex formula, so far as adding the "phosphate solution by degrees to the iron solution until it ceases to cause a precipitate" is concerned, from the fact that the precipitate yielded by the process is not only abundant, but, when cold water is employed so gelatinous, and therefore subsides so slowly, that it becomes tedious to discover, as well as exceedingly difficult to determine, the exact point at which precipitation ceases on adding the phosphate solution. All this, however, may be overcome by simply taking the proportion of phos-

phate of soda which experiment has determined to be necessary to thoroughly decompose the iron salt. This will be found to be nearly double by weight of phosphate to the quantity of sulphate taken. In point of theory the proportion is somewhat less, but it is better to add an excess of phosphate, which is harmless, and thus ensure a complete decomposition of the iron salt. With this proportion of phosphate of soda a yield of phosphate of iron after washing the precipitate may be obtained with ordinary care of from 85 to 90 per cent., showing what must be considered a minimum waste in precipitation and by oxidation of the ferrous salt. Not the least important feature of this formula is the certainty with which all the precipitate may be recovered. The ferrous salt may precipitate gelatinous or granular, but under either circumstance the supernatant liquor, on testing, will be found to give only a trace of its presence.

As to the proportion of water employed in the two formulæ respectively, that of the Codex is much to be preferred, from the simple fact that with the smaller quantity, and especially if the solutions be mixed while cold, it is impossible to get a precipitate that will at all subside, as a thick gelatinous mass is produced. Using the larger quantity, however, and above all using it tepid, a granular precipitate at once forms, and subsides almost immediately without any difficulty. This allows the precipitate to be more quickly washed, and lessens very considerably the risk of loss by oxidation.

The preparation of the ferrous phosphate by this process has been touched upon at some length, not only because of its general simplicity and superiority, but also because it is from this salt that much of the unsatisfactory and uncertain element is imported into the various syrups. No process yet published has so much to commend it, so far as the preparation from it of an elegant and standard syrup is concerned, with probably the single exception of the process recommended, first of all some considerable time ago, and more recently again revived, of preparing the syrup from a phosphate obtained by direct decomposition of iron wire with phosphoric acid. This last process, doubtless, is capable of yielding a syrup nearly perfect, both as regards strength and general appearance, but it has this one fatal objection—fatal, at least, so far as regards Parrish's Syrup, the most popular of all—namely, that it imparts a most peculiar metallic flavour to the syrup, exceedingly objectionable alike to children and invalids. This flavour is difficult to describe, but those who have tried the process will readily understand what is meant and admit the objection.

Another prolific source of annoyance, and often of error, in the preparation of the various syrups is the employment of glacial phosphoric acid. The uncertainty in the purity and strength of this acid has repeatedly been pointed out, and even Parrish, in his "*Pharmacy*," tacitly admits the objection: therefore no syrup, however perfect the formula might be for the phosphate of iron, can possibly be satisfactory in its nature or entirely reliable into which it enters. The substitution, therefore, for it of the syrupy phosphoric acid (sp. gr. 1.500) obtained by the oxidation of phosphorus with nitric acid is not only to be commended, but has even already been very generally adopted. Amongst its other advantages it may readily be obtained in a state of comparative purity and uniformity of strength, containing, according to Watt's table, about 50 per cent. anhydrous acid (P_2O_5). These changes, together with several other improvements not here referred to, but which have from time to time been recommended by different writers on these preparations, suggested some time ago the advisability of anew revising all the formulæ for the syrups of the phosphate of iron. Considerable experience and experiment have proved that all those now to be submitted produce a syrup in each individual case nearly uniform in strength, appearance, taste, and general keeping properties. The various precipitates, it need scarcely be added, should all be prepared immediately before using, as when kept even for a short time they seem in every case to undergo some molecular change whereby their solubility in the acid is considerably modified. In respect to the density of the syrups, the B. P. density for syrups ferri phosphatis has in each been adopted, as it not only protects the salts sufficiently, but a denser syrup has been sufficiently proved to be more than objectionable.

SYRUP OF PHOSPHATE OF IRON.

Sulphate of iron (granular)	..	..	245 grs.
Phosphate of soda (crystallised)	..	..	490 grs.
Distilled water (warm)	..	..	30 fl. ozs.
Syrupy phosphoric acid (sp. gr. 1.500)	..	..	1 fl. oz.
Distilled water (cold)	..	..	A sufficiency
Sugar	..	..	8 ozs.

Dissolve each of the iron and soda salts separately in one half of the hot distilled water; add the phosphate of soda solution gradually to the sulphate of iron and agitate briskly between each addition. Let the mixture stand until the precipitate subsides, and then decant the supernatant liquid, replacing it with more distilled water. Shake thoroughly, and again allow the precipitate to subside, repeating alternately the decantation and the addition of more distilled water until the supernatant liquid ceases to give a precipitate with chlorido of barium. Next collect the precipitate and add to it the phosphoric acid, previously diluted with a little water, and immediately the precipitate is dissolved filter the solution and dilute with distilled water, if necessary, to six fluid ounces, to which add the sugar and dissolve without heat. The product should measure, when finished, exactly twelve fluid ounces, and allowing for oxidation during the process of washing, &c., should contain one grain ferrous phosphate ($Fe_3P_2O_8$) in each fluid drachm. This syrup, whilst not differing in any essential feature from the B. P., in several respects is very much superior to it. When ordinary care has been employed in its preparation it will be always found of standard strength, which the syrup prepared after the B. P. formula never is; and moreover, it will keep well, even in the bulk, for a considerable period.

SYRUP OF PHOSPHATE OF IRON, QUININE, AND STRYCHNINE.

(*Easton's Syrup.*)

Sulphate of iron (granular)	245 grs.
Phosphate of soda (crystallised)	490 grs.
Distilled water (warm)	30 fl. ozs.
Sulphate of quinine	96 grs.
Strychnine (crystal)	3 grs.
Dilute sulphuric acid	{ A sufficiency
Solution of ammonia	
Distilled water	
Syrupy phosphoric acid (sp. gr. 1.500)	1 $\frac{1}{2}$ fl. oz.

Dissolve the sulphate of iron and phosphate of soda, each separately, in one-half of the hot distilled water; mix the solutions, wash and collect the precipitate as directed in the previous syrup. Next, with sufficient dilute sulphuric acid, dissolve the quinine, previously mixed with two ounces of water, re-precipitate the quinine with the solution of ammonia and carefully wash it on a filter until the filtrate ceases to give a precipitate with chloride of barium. Dissolve the phosphate of iron and the quinine thus obtained, as also the strychnine in the phosphoric acid diluted with a little water; filter the solution, and add more water, if necessary, to make the whole measure 6 fluid ounces. Add to this the sugar, and dissolve without heat. The product should measure, when finished, exactly 12 fluid ounces, and will contain 1 grain each phosphate of iron ($Fe_3P_2O_8$) and quinine, and 1-32nd part of a grain of strychnine in each fluid drachm. In practice it will be found the better plan, where the two foregoing syrups require to be stored, to preserve them in small bottles of 6 or 8 ounces capacity, tightly corked, and with as little exposure to air as possible. Thus stored, it will be found that they will keep, if carefully prepared, of good colour, and without precipitation, for months.

COMPOUND SYRUP OF PHOSPHATES.

(*Parrish.*)

Sulphate of iron (granular)	984 grs. (2 $\frac{1}{2}$ ozs.)
Phosphate of soda (cryst.)	1,968 grs. (4 $\frac{1}{2}$ ozs.)
Phosphate of lime	960 grs. (2 ozs. 85 grs.)
Distilled water (warm)	6 pints
Syrupy phosphoric acid (sp. gr. 1.500)	4 $\frac{1}{2}$ fl. ozs.
Carbonate of soda (crystal)	40 grs.
Carbonate of potass	60 grs.
Hydrochloric acid	{ A sufficiency
Solution of ammonia	
Distilled water	
Cochineal roughly powdered	120 grs.
Conct. orange-flower water	1 fl. oz.
Sugar..	32 ozs.

Dissolve the sulphate of iron and phosphate of soda, each separately, in two and a half pints of hot distilled water; add the phosphate solution by degrees to the sulphate of iron, wash and collect the precipitate as in the previous syrups. Next take the phosphate of lime and mix it with the remainder of the hot distilled water; add sufficient hydrochloric acid to dissolve it; filter when cold, and then re-precipitate with solution of ammonia, washing the precipitate carefully with water until the filtrate ceases to give a precipitate when dropped into a solution of nitrate of silver acidulated with nitric acid. Mix the two phosphates thus obtained with eight or ten ounces distilled water, add the phosphoric acid, and when clear filter and add the carbonates of potass and soda, previously dissolved in one ounce distilled water. To the solution now add sufficient hydrochloric acid to dissolve any precipitate which may have formed on the addition of the carbonates, and water sufficient to make the whole measure twenty-two fluid ounces. Dissolve in this the sugar without the aid of heat, and add the orange-flower water and the cochineal colouring (which is best prepared by simply digesting the cochineal for a short time in an ounce of boiling water and then filtering), making the whole product measure 48 fluid ounces. Each fluid drachm contains one grain ferrous phosphate, two and a half grains calcic phosphate, with fractions of a grain of soda and potass, besides free phosphoric and hydrochloric acids. The only difficulty which is likely to arise in the manipulation of this formula will be in the precipitate formed on the addition of the carbonates of soda and potass to the phosphate solution. In theory the addition of the carbonates as above ordered is a somewhat clumsy expedient, but in practice the disadvantage will be found to be counterbalanced by the action of the free hydrochloric acid, so that after all the original formula may, on the whole, have most to commend it, and is therefore adhered to in this formula.

The foregoing are the syrups most in repute, but the following are also held in considerable esteem by many medical men, and their formulæ may therefore be useful:—

SYRUP OF PHOSPHATES OF IRON AND LIME

May be prepared exactly as the foregoing, omitting the carbonates of potass and soda, the free hydrochloric acid, with the colouring and the flavouring.

SYRUP OF PHOSPHATES OF IRON AND QUININE

Is prepared the same as Easton's syrup, omitting the strychnine.

SYRUP OF PHOSPHATE OF IRON AND MANGANESE.

Sulphate of iron (granular)	245 grs.
Sulphate of manganese	48 grs.
Phosphate of soda (crystal)	590 grs.
Distilled water (warm)	30 fl. ozs.
Syrupy phosphoric acid (sp. gr. 1.500)	1 fl. oz.
Distilled water, cold	A sufficiency
Sugar	8 ozs.

Dissolve the sulphates of iron and manganese in one half of the warm water, and the phosphate of soda in the remainder. Mix, wash, and collect the resulting precipitate as directed in the previous syrups, and finally add to it the acid, previously diluted with a little water. Filter and add the sugar, making the whole product measure exactly twelve fluid ounces. Each fluid drachm contains one grain phosphate of iron and half a grain phosphate of manganese.

SYRUP OF PHOSPHATE OF IRON AND NICKEL.

Sulphate of iron (granular)	245 grs.
Sulphate of nickel	58 grs.
Distilled water (warm)	30 fl. ozs.
Phosphate of soda (crystal)	580 grs.
Syrupy phosphoric acid (sp. gr. 1.500)	1 fl. oz.
Distilled water (cold)	A sufficiency
Sugar	8 ozs.

Proceed as in the last syrup. The product when finished should measure 12 fluid ounces, and contain one grain phosphate of iron, and one-fourth grain phosphate of nickel in each fluid drachm.

In submitting these formulæ it is presumed that the necessity for care in their manipulation will be quite understood and conscientiously attended to. No formulæ for the phosphate of iron preparations, however excellent in themselves, will compensate for carelessness. If ordinary water, for example, be substituted for distilled, or commercial sulphate of iron (always partially oxidised) be taken for granular or pure, or if the precipitates be carelessly washed or unnecessarily exposed, the result will undoubtedly end in disappointment and failure. If, on the contrary, the directions be rigidly attended to, and ordinary care observed in the different processes, a syrup in each case will be the result on which dependence can be placed as to strength, and which will be certain to afford some pleasure in dispensing.

THE ANALYSIS OF BUTTER.

MR. BELL, the Principal of the Laboratory at Somerset House, has published a report to the Board of Inland Revenue, detailing his investigations in regard to the analysis of butter.

At the time that these investigations were commenced, he says, there was a great difference of opinion among chemists as to the possibility of detecting the adulteration of butter, so far as related to the admixture of foreign fats. These divergent views were notably expressed in the scientific evidence on the adulteration of food given before a Committee of the House of Commons. Some chemists of considerable repute held that there were no means of detecting foreign fats in butter, and that it would be easy to make up a factitious butter which would baffle all attempts at analysis, so far as the then known tests would apply. Others, on the other hand, maintained that, by certain empirical methods, such as taking the melting-point of the fat, or determining its degree of solubility in mixtures of alcohol and ether, foreign fats could with certainty be detected. It was in these circumstances that we undertook the investigation of butter, and we commenced by fairly trying all the methods of butter analysis that had been suggested, and which appeared to afford any hope of assisting in the solution of the question. One of the methods most recently suggested was to estimate the amount of fixed fatty acids which a butter would yield. This test, which was devised by Messrs. Angell and Hehner, and which is based upon the fact that genuine butter contains a less amount of these fixed acids than other animal or vegetable fats, was the nearest approach to the solution of the question which had been made. But their standard of purity, which was founded upon the analyses of a few samples obtained from one part of the country and about one time of the year, was looked upon with suspicion, and met with but little acceptance from analysts, so that the test for some time practically fell into abeyance. It was found, however, that although the test was sound in principle, it involved a somewhat difficult chemical process in its application, and required a

considerable amount of manipulative skill to carry it out. We therefore directed our attention to the devising of a more simple and more easily applied test, and in this, I think, we have succeeded.

This method consists in the determination of the specific gravity of the butter fat in the liquid condition at 100° Fahr.

We are not aware that this method had ever before been applied in the analysis of butter. It is true that there had been an endeavour to determine the specific gravity of some of the constituents of butter fat when in the solid condition; but no useful result had been arrived at—in fact, the results were rather misleading than otherwise. In applying the specific gravity test to butter, the curd, salt, and water are first removed, and the density of the melted fat at 100° Fahr. is taken in an ordinary specific gravity bottle. The bottle used for the purpose was of a pear-shape, into which could be inserted the bulb of a sensitive thermometer, the mercurial portion of which extended nearly the whole depth of the bottle. The temperature of 100° Fahr. was adopted, as at that temperature nearly all the animal and vegetable fats likely to be used as butter adulterants assume the liquid state.

It will be seen from Table I. that the specific gravity of ordinary animal fats varies from 902·83 to 904·56, while the specific gravity of butter fat rarely falls below 910, the usual range being from about 911 to 913. There is thus a material difference between the specific gravity of butter fat and that of ordinary commercial animal fats, and it is obvious that this difference affords a satisfactory basis upon which to found an additional test for determining the purity of butter.

It may be useful to describe here briefly the difference between the composition of ordinary animal fats and that of butter fat. The former consist of a mixture of stearic, palmitic, and oleic acids, in combination with glycerine; and, as these acids are insoluble in water, and not readily volatilised, they are commonly called "fixed" fatty acids, in contradistinction to other fatty acids which are either volatile or soluble in water, such as butyric, caproic, caprylic, &c., acids. Butter fat also consists of fatty acids in combination with glycerine; but while by far the larger proportion of the acids are of a "fixed" nature, there are invariably present several of those which are volatile or soluble in water, and it is to the latter, the most important of which is butyric acid, that the characteristic taste and smell of butter are chiefly due. In rich butters the proportion of the volatile acids is comparatively large, the specific gravity of the fat is high, and the percentage of "fixed" fatty acids is correspondingly low. In getting samples of butter we purposely selected a wide range, so as to obtain, as far as possible, fair representative specimens of the different variations that occur in the composition of genuine butters produced under different conditions. In short, the samples may be taken to fairly represent the various qualities of butter as made and brought to market by farmers both in England and Ireland. Every care was exercised by the Board's local officers in procuring them, and there can be no question whatever as to their being genuine.

TABLE I.—*Results of Analyses of Animal Fats.*

Description of Sample	Specific Gravity at 100° Fahr.	Percentage of fixed Fatty Acids
Mutton suet	902·83	95·86
Beef suet	903·72	95·91
Fine lard	903·84	96·20
Dripping (commercial)	904·56	94·67
Mutton dripping (genuine)	903·97	95·48

Table II. in Mr. Bell's report gives the results of the analyses of 117 samples of genuine butter, showing first the proportion of water, salt, and curd, and of butter fat. The latter varies from about 70 to 90 per cent., but is usually over 80. Curd varies from 50 to over 3 per cent.; salt from 40 to 15 per cent.; and water from 4·15 to over 20 per cent. The samples were taken from the butter producing counties of England, Wales, and Ireland. Taking next the specific gravity of the butter fat at 100° Fahr. the table shows the variations to be generally limited between 910 and 913. Two samples only out of the 117 fall a little below the 910, and not one reaches 914. The melting point varies from 86° Fahr. to 94° Fahr.; the percentage of fixed fatty acids (which has not been taken in all cases) averages from 86 to 88.

A very important result of this undertaking is to be noted in the fact thus stated by Mr. Bell:—

When the fixed fatty acids test referred to is accurately performed, the correspondence between the amount of these acids and the specific gravity of the fat is so close that it is possible to predicate within a few tenths one result from the determination of the other. Owing to the pressure of other duties the proportion of fixed fatty acids in each sample was not ascertained, but a sufficient number of determinations have been made to establish the fact of this correspondence. As the estimation of the fixed fatty acids is a lengthy process, attended with difficulty, and, without great care, nearly always with a measure of uncertainty, and as, on the other hand, the specific gravity of the butter can be ascertained with ease and rapidity by any person of ordinary skill, it will be seen that an important additional factor in the analysis of butter has been furnished to chemists. The specific gravity of a fat may be repeated with but slight variation, which in several successive weighings will not exceed from .02 to .05 of a grain. A noticeable feature in the results recorded in Table II. is the great variation in the quantity of water in the different butters, the lowest being 4·15 per cent., and the highest 20·75 per cent. The Devon and Dorset butters, which usually stand so high in the market, were found to contain in nearly all cases a high percentage of water, and No. 15, which was procured from the dairy of a private gentleman, contained as much as 16·99 per cent., and a second sample, recently obtained from the same source, contained 15·70 per cent. Various attempts have been made by chemists to separate the glycerides of the fatty acids in butter, without success. We have experimented in the same direction by treating butter fat with different solvents, such as alcohol, mixtures of alcohol and ether, and ether alone, but the fractional parts still remained essentially a butter. The following is an outline of the process which we adopted to separate the component fats of the butter. A quantity amounting to 460 grammes was treated successively with twice its volume of alcohol of 92 per cent.; the alcoholic solution on evaporation gave nine grammes of an oily fat which yielded 79·7 per cent. of fixed fatty acids, the remainder consisting of glycerine and the volatile acids. The butter fat insoluble in alcohol was next treated with twice its volume of warm ether, and allowed to stand for several hours. A white crystalline fat separated, which was thrown on a filter and washed with a small quantity of ether. The ether was evaporated from both portions, and the specific gravity and fixed fatty acids determined. The crystalline fat, weighing 90 grammes, had a specific gravity of 909·55, and gave 89·50 per cent. of fixed fatty acids. The soluble fat, weighing 350 grammes, had a specific gravity of 912·35, and yielded 87·92 per cent. of fixed fatty acids. The portion soluble in ether was then treated with a mixture of alcohol and ether. Nearly one-half of the fat passed into solution. Both portions were freed from alcohol and ether. The soluble gave 86·50 per cent. of fixed fatty acids, and the insoluble 88·62 per cent. We then proceeded synthetically, by adding to a mixture of beef-suet fat and dripping a given percentage of prepared butyrate of glycerine; 8 per cent. of the butyryl was dissolved in a fat of a specific gravity of 902·99 by the aid of heat. The specific gravity of the mixture at 100° Fahr. was 910·39. The mixture, when treated with alcohol, as in the preceding experiment, was almost completely freed from butyryl, as was shown by the residual fat giving a specific gravity of 903·44. The extractive by alcohol contained a little olein derived from the fat.

The conclusion which may be drawn from these results is that, contrary to the statement made by Berthelot and others, compounds of butyric and the other volatile acids present in butter with glycerine do not exist as simple glycerides, but are in all probability present in a complex form, the radicals of the volatile fatty acids being combined with glycerine and the fixed fatty acids in the same molecule to form compound ethereal salts. It may be noted here as remarkable that the portion dissolved out with alcohol in the first experiment yields an amount of fixed fatty acids bearing out this theory. We purpose following up this part of the investigation, which appears to possess considerable scientific interest. There is another point of interest which we have in some measure elucidated, and which has reference to the deterioration which certain butters undergo when kept in small quantities in glass or earthenware vessels. We have found that whilst some of the finest and best prepared butters undergo little or no change, there is in others a gradual disappearance of the characteristic principles of butter, and a consequent assimilation to the constitution of an ordinary animal fat. This change, which

appears to be due to an incipient fermentation, and is generally accompanied by the development of fungi, is probably caused either by the use of sour cream or by insufficient care in making the butter.

As cases may occur where the melting point becomes of primary importance, this test is never overlooked in the analysis of a reputed butter. In determining the melting point we found that more uniform results were obtained if the butter fat were suddenly cooled by plunging the small platinum capsule containing it into ice-water. A small portion of the fat which had a somewhat vitreous appearance was taken up on the loop of a platinum wire and introduced into a beaker of water placed in a porcelain dish, and the loop brought close to the bulb of a thermometer. The temperature of the water was slowly raised, and read off immediately the fat assumed the liquid condition.

The following table (III.) exhibits the amount of depreciation which different samples of butter have undergone in the respective times stated :—

TABLE III.—Analyses of Butter after keeping.

No.	Original Butter			After keeping		
	Specific Gravity at 100° Fahr.	Percentage of fixed Fatty Acids	Time kept	Specific Gravity at 100° Fahr.	Percentage of fixed Fatty Acids	
1	912.28	87.30	12 weeks.	910.74	88.97	
2	911.58	87.80	7 "	909.19	90.00	
3	913.89	85.50	7 "	913.57	85.72	
4	911.78	87.40	6 "	911.00	87.97	
5	911.06	87.72	8 "	910.61	88.40	
6	911.48	87.65	6 "	911.33	88.00	
7	912.39	—	12 "	911.28	—	
8	912.18	—	12 "	910.39	—	
9	912.28	—	12 "	911.24	—	
10	913.97	—	16 "	913.92	—	
11	910.19	—	8 "	908.15	—	
12	910.62	—	8 "	910.13	—	
13	911.04	—	6 "	910.75	—	
14	911.40	—	8 "	911.00	—	
15	910.70	—	5 "	910.57	—	

THE LIFE AND WORK OF LIEBIG.

(Concluded.)

LECTURE III.

Distillation and Reduction of Metallic Oxides—The Physiology of Plants, and the Natural Laws of Husbandry.

There remain, gentlemen, from the former lecture, a few points of importance which I wish to dispose of before entering upon the principal subject of the evening. We have described, and seen in action, various kinds of apparatus relating to organic analysis, to analysis of the air, and others. We have to-day to consider an apparatus which has been largely used in manufactures, namely, the so-called Liebig's cooler. It stands now before you, and is in action. You perceive that a vessel, in which a liquid is boiling, is connected with a tube in which the vapours evolved by the boiling liquid are being condensed; and on the other side you perceive a vessel which is destined to receive the contents of the other vessel. You see, moreover, that the tube in which the liquid condenses is surrounded by a second tube, and the space between the inner and outer tube is filled with cold water. Now there is nothing, of course, new in the principle of condensing hot vapours by cold water; but what is new is the logical arrangement by which that process of condensation is conducted, and this consists in the application of the law that cold water is heavier than hot, and, therefore, in a mixture of cold and hot waters, will remain at the bottom, whereas the hot water will rise to the top. That is exactly what takes place in Liebig's cooler, namely, the cold water, entering at the lowest point, gradually rises and displaces any water which may have become hot by the process of condensation. The advantages, therefore, are that all the water which runs through the apparatus at a measured rate is fully used for the purpose for which it is intended to be used; further that the hottest part of the vapours comes in contact, not with the coldest part of the apparatus, but with the hottest part, and that, as the cooling of the vapours increases, so the coolness of the water increases. Hence, there is introduced an element of security which prevents the apparatus from being broken; and, moreover, the apparatus being straight, and, as you see, of glass, admits of perfect cleaning. In former times, and, indeed, almost up to the time in which this apparatus was invented, most condensing apparatus were made of metal tubing. They

were, as far as I know, never straight, but always shaped in the form of a worm. Hence, the cooler, in trade, was generally called a worm. Of course the cleaning of such an apparatus for chemical purposes was next to impossible, and, therefore, in laboratories you hardly see worms employed, except, perhaps, for the distillation of water and of common spirits. This, then, is the arrangement of Liebig's cooler, which is used in all laboratories throughout the world in the form which you there see, and is known by his name.

The application of another principle is going on on the right hand side. It is the application of a body which, though Liebig did not discover it, he was the first to produce on a manufacturing scale, namely, cyanide of potassium. In his studies of that remarkable substance he found that it had a powerful influence upon metallic oxides, and when brought together with them, and in a state of fusion, had the power to reduce these oxides, and transform them into metal, or, what is the same, the cyanogen in the cyanide was burnt at the expense of the oxygen in the oxide. The process, therefore, in a manner, is the reverse of that which you saw in the last lecture. You then saw that organic substances were being burnt by oxide of copper, with a view to the determination of the carbon and hydrogen contained in those substances. Here you see, on the other hand, oxides being reduced by organic matter, or what I will call organic matter, namely, cyanogen, for the purpose of obtaining the metal in a pure state. This application of cyanide of potassium, in conjunction with carbonate, is now commonly used for the production of a variety of metals, and particularly of silver. We are here engaged in fusing a little cyanide of potassium, and we have thrown in some red oxide of lead, and if we wait a little time we shall see the metallic lead collected in the bottom of the glass. If we had any better arrangements for heating the operation would be instantaneous, but it is very difficult, with a mere gas lamp, and without reverberating protection, so to heat the vessel that the fusion shall be one of ease and quickness. However, I can show you the result. We have here prepared a metallic regulus, or king, of lead, as it was called by the ancients, by the very same process which you see going on. Mr. Kingzett has so beautifully regulated the action that you can see the fused cyanate and carbonate on the top, and the metallic lead at the bottom.

The cultivation of the surface of the earth for the purpose of producing food or other articles of use and enjoyment for himself or his domestic animals is one of the oldest occupations of man. It might therefore be supposed that human experience with regard to this branch of human action was greater than with regard to any other; it might be supposed that mere experience had collected the body and volume of a science, and had arrived at the recognition of principles capable of guiding the action of the complete and free understanding. But this is not the case. The agriculture of the past has not only reared and fed nations, it has also ruined and exterminated them, and has left entire countries in such a state that neither the nomad nor the hunter could make a living in them. By its ultimate effects it has convulsed empires, mixed nations, and produced most of the conditions of the thousand years of intellectual darkness which we term the Middle Ages.

The writings of the ancients on agriculture partake, with few exceptions, of the nature of prescription; and if I may judge from my own reading of some of these authors, I should say that, e.g., the book "De Re Rustica," commonly attributed to Cato, was mainly based upon the recipe book of his grandmother. However, even the best amongst these writers had no influence on the practice of mankind during the Dark Ages, simply because their books were hidden away, or destroyed by the ignorant fervour of the terrible belief which destroyed nearly all the intellectual achievements of antiquity. And even after the revival of learning, literature had no effect on agriculture, because the agriculturists were not learned in any way. Tillage remained a routine. When it failed definitely the tiller was dispossessed, and either died or became a slave, or went to a new country. There were neither teachers nor schools to appreciate, evolve, record, or teach principles. To this neglect the earth replied by famine and plagues; by these man came into the bonds of superstition; and while millions of idlers in monasteries and convents devoured the substance of entire kingdoms, mankind shook the chains of its ignorance, and found them too strong for breaking. Liberty came by a liberator unheeded and unbidden; unaided by priesthood, which had been battling against the evils in vain; the causes of the evils and their remedies were discovered by science.

The first physiological observation of plant life excited wonder, but remained without consequences for centuries. Van Helmont's experiment upon the willow twig, which grew to be a little tree while being nourished with what appeared to Van Helmont to be pure water, rather mystified than instructed. It was the vital force, he said, which transformed water into the constituents of a tree; and the same force he believed had produced from water the large amount of ash which he obtained from his willow tree on combustion. That a plant takes its carbon from the air, its ash from the soil, in the case of the willow tree from the pure water—which contains the mineral matter in solution—escaped even his suspicion.

We have seen in the second lecture, from the testimony of Klaproth, that when he discovered potash in a mineral, no one person then living would have thought such an occurrence likely. Yet even in 1819 the Academy of Amsterdam offered a prize for the best answer of the question, whether or not potash was produced during the combustion of plants. The question was correctly answered by J. F. John, who received the prize. The discovery of oxygen had led to a correct appreciation of the process of respiration in animals, and when the question was extended to plant life, an inverse action was found. Already towards the end of the last century, the researches of Saussure on vegetation had led him to the result, only partially correct, that the constituents of plants are taken from the earth in the same form in which they appear in the plant on chemical analysis. The German translator of Saussure, Voigt, adopted most of what was erroneous in Saussure's treatise, and controverted that which was mainly true. He assumed that potash and lime in the ashes of plants are produced by the process of combustion; nay, he believed that the so-called nitrogen was mainly instrumental in producing the lime and the alkalies. These doctrines passed into the theory of practical agriculture, and were then interwoven with the dogma of the "organic mould," and this combination formed the basis of all practical teaching in agriculture during the first forty years of the present century. The greatest continental writer on agriculture, A. Thaer, and the greatest number of educated persons who began to pay attention to husbandry as a pursuit worthy of the application of the highest intellect (mark the merit of the man, and of his followers) looked upon animal and vegetable mould (*humus*) as the almost exclusive source of the food of plants. The most perfect humus they acknowledged was decayed dung, but the conditions of the action of the best dung were so little understood that Thaer still believed that the earths, which are constituents of plants, are formed within these organic bodies themselves. And at that time it was difficult to believe otherwise, as the Royal Academy of Berlin had given its prize to an essay by Schrader, in which it was maintained that the plants produced the incombustible matter themselves during their growth as products of their vitality. That inorganic or mineral substances applied to the land could serve by increasing vegetable growth was well known, e.g., from the example of gypsum in increasing the growth of clover (for the advancement of which Johann Christian Schubert was knighted by the Emperor Joseph II., with the title of "Knight of the Holy Roman Empire of the Clover-field"), and others, but these facts were explained by the assumption that inorganic matters act either upon the roots as a spice would act upon the tongue, by stimulating, as it was termed, vital action, or upon the soil only, in which they decompose the mould and make it more ready to be taken up by the plants. These views influenced those of the principal chemists of that time, Berzelius, Mitterlich, Saussure, Sprengel, and Mulder. Saussure, the most scientific inquirer in the field of vegetable physiology, recognised that the plants which grew without aid from man took their carbon from the atmosphere, but for the plants on tilled soil he still believed "mould" to be an essential source of nutriment. In a similar manner, Saussure maintained that the inorganic ingredients of plants were taken from the soil and possessed the character of nutriment, a proposition to which Sir Humphrey Davy gave great precision. Sprengel, in his works on soil and manure, maintained (1839) that the barrenness of certain soils was the result of the absence of certain inorganic substances. But these propositions lacked proof of convincing power, and about 1839, the University of Göttingen offered a prize for the best essay on the question whether inorganic matters would occur in plants if they are not offered to them in the soil, and whether these inorganic matters are really essential to the constitution and development of plants.

Under these circumstances appeared, in 1840, Liebig's work,

"Organic Chemistry in its Application to Agriculture and Physiology." I remember well the curiosity with which it was scrutinised by the gentlemen farmers, and how they could, as the saying is, make neither head nor tail of it. Their inability to appreciate or controvert arose from their complete want of knowledge of elementary matters and even terms concerning the matters at issue. But in scientific circles the work met with immediate appreciation, and it is well described in the words of Stohmann: "The careful study of this work excites astonishment at the geniality and boldness with which frequently, by a kind of prophetic eye, facts are recognised and conclusions drawn, the correctness of which could be doubted at that time, but is now above all cavil." The book was revolutionary, for it broke with the past and the established doctrine of the humus or mould as completely as the chemistry of Lavoisier had broken with the phlegistic hypothesis, for it taught that the first sources of the nutriment of plants are furnished exclusively by inorganic nature; the carbon of the plants is derived from the carbonic acid of air, water, and soil; their hydrogen from the water; their nitrogen from the ammonia which is present in air, rain, and soil; their sulphur is derived from the sulphuric acid in soil and minerals; their oxygen from air and water; their phosphorus is derived from the phosphoric acid contained in minerals and soil; the earth and alkalies found in plants are essential constituents and are derived from the soil; they have special functions in plant growth and in different organs at different periods of growth.

Liebig proceeded analytically against the hypothesis of the nourishing mould. He showed that humic acid, the principal constituent of humus, entirely loses its solubility in water when it becomes dry, or frozen with the water in which it may be dissolved; it cannot be maintained soluble by the alkalies present in the soil, because they are insufficient in quantity to dissolve as much humic acid as would suffice to produce the carbon in any one period of vegetation; further, he argued, from the known solubility of the humates, particularly humate of calcium (as previously from its known combining proportion), that all the water which fell upon a given surface was insufficient to dissolve as much humate as was required to supply the plants with their necessary carbon. He further argued that fields with excess of humus did not produce more than fields in which this element was deficient, and that the conveyance of humus alone to fields of known productive power did not increase their fertility. The carbon of vegetables, he concluded, does and can only come from the atmosphere, which contains of this gas more than the vegetables require. The phenomenon, which had been, when first discovered, supposed to be one of respiration only, namely, the absorption of carbonic acid, and exhalation of oxygen equal in volume to the carbonic acid absorbed (which Saussure had shown to be the sole source of nutrition of the wild or uncultivated plants, though he believed that the cultivated plants could not live upon the atmosphere only as regards carbon, and required other sources), Liebig showed to be a universal law of plant-growth. He pointed out the antagonism between animal and vegetable life, the former constantly producing, the latter destroying, by assimilating carbonic acid; the former vitiating the atmosphere for themselves, but making it nutritive for plants, the latter purifying the air, and ultimately offering in their own substance material for the construction and maintenance of the animal body, notably a large amount of carbon, so essential for the production of animal heat. He fully established, as it has been termed, the theory of the circulation of carbon in nature.

Very singular was the bearing of some botanists of profession, who, given entirely to the organographic, or systematic, or morphological (in Goethe's sense) study of botany, cared as little about, and knew as little of chemical physiology as many of the animal physiologists of our day. Thus Schleiden, otherwise a meritorious writer, who twenty-five years ago received more attention in Germany, notably on account of his endeavours to develop Goethe's idea of an arch-plant, and its metamorphoses into all the present genera and species (an idea very different indeed from that which we owe to Darwin), said, in a critical pamphlet hurled against Liebig, that the only new thing in the book was the view that the plant absorbed the carbonic acid of the air by means of its leaves, a view which he declared to be completely untenable. The view, as we have seen, was more than forty years old, but was no more appreciated by this botanist than by the great majority of his calling, or by science at large, least of all by agriculturists. They sowed and harvested, but like the birds of heaven,

they inquired not whence the carbon of their bread and butter originally came. Now-a-days, nobody doubts its source. Ingenhousz and Saussure had found that plants reverse their respiratory action during night and darkness, and exhale carbonic acid while inhaling oxygen. This Liebig explains as a chemical action in which the plant behaves like a dead body. The reduction of water and carbouic acid require the action of sunlight and heat upon the leaf; failing these powers, the substances in the plant-tissue follow their own chemical attraction; the resins absorb oxygen, the tannic acids also; from neutral hydrocarbons arise acids; sunlight reverses this action again, and a plant which, like the *Cacalia ficoidea*, is acid in the morning like rhubarb, is tasteless about mid-day, and bitter in the evening. The carbonic acid which plants exhale at night, he explains as being unused stores, carried with water from the soil, and emitted by simple diffusion in the absence of chemical action. Some hold this view to be open to objection, and admit a more complicated theory, by Sachs, but to me the whole of the facts known on the subject seem satisfactorily and uniformly explained by the theory of Liebig.

The actual use of humus in plant growth was well shown by Saussure and recognised by Liebig, though it is sometimes wrongly imputed to him that he had ignored or denied it. He admitted that it was, by means of its oxidation, a continuous source of carbonic acid for the roots to take from, and he also perceived that it had the effect of making or maintaining the soil porous, so that it could be easily penetrated by air and rain, and by the growing roots. He also admitted that the mould furnished nitrogen for the use of the plants; and in later editions of his work showed that it performed most complicated functions in plant life, functions, however, which merely mineral soils, destitute of mould, sometimes mere sand, perform with almost equal precision.

Regarding the hydrogen of vegetable matters which do not contain nitrogen, Liebig maintained that it was derived from the water. Thus sugar, starch, and cellulose can be considered as carbonic acid in which half the oxygen has been replaced by hydrogen. The oxygen substituted, and that separated from the water, were both expelled by the action of the sun under the guidance of the forces united in the plant. The intermediate stages in this action are represented by the organic acids, which, becoming gradually de-oxidised in the order from oxalic, through malic, tartaric, citric, aconitic, maleic, fumaric, are capable of yielding radicals, which by simple triplication furnish the hydrocarbons of the sugar class. From sugar to fat is a simple process, which is, however, more easily performed in the animal.

Entirely original, and not based upon the experiments or doctrine of any predecessor, was Liebig's teaching regarding the nitrogen formed in the gluten, albumen, fibrine—the organic bases contained in plants. He reminded that plants can be developed in calcined earth if this be mixed with some peat ash and watered with rain water. The burnt earth and ash containing no nitrogen, this element must come from the rain water. The rain water can contain nitrogen only in three forms, as nitrogen gas, the same as in the atmosphere, as ammonia, or as nitric acid. Saussure had shown that the nitrogen of the air was not assimilated by plants, and this has been confirmed by all later experience. Consequently, said Liebig, there remain only the ammonia and nitric acid of the rain water as sources of the nitrogen in plants. He proved the presence of nitrate of ammonia in 17 out of 77 rain-falls, of which he analysed samples. Other chemists subsequently, by more delicate tests, discovered in the progress of analytical chemistry, showed that all rain water, without exception, contains ammonia and nitric acid, and that the rain which accompanies electric discharges is particularly rich in these substances. Thus a thunderstorm was shown to do in the open air what Cavendish had discovered the electric spark to do in a closed space. The experiment of the philosopher, nearly a century after its performance, threw light upon the problem presented by organic nature. How great is the action of electricity in this respect can be seen from the fact that a single hectare receives per annum from 13 to 44 kilogrammes of ammonia, and from 7 to 61 kilogrammes of nitric acid, the larger quantities near inhabited, the smaller in desolate places.

What Berzelius had maintained in 1837, that the nitrogenous matters of plants were derived from the humus, was yet maintained by Saussure in 1842, two years after the publication of Liebig's work. He would not deny, he said, the usefulness of ammonia as an ingredient of marl, clay, manure, but it did not

combine with plants in the isolated state; its action was that of a solvent of the humus, and of the organic matter contained in the soil and air. From this it can be seen how untrue was the statement of Schleiden, that "Saussure had first developed with acumen that ammonia salts are the source of nitrogen in plants, a view which has been further extended by Liebig." This kind of robbery of most of his own discoveries Liebig resented with a lofty demeanour and genuine contempt.

If organic matter, decaying animal and vegetable tissues, manure and mould of all kinds, are capable of yielding nitrogen to the plants, it is only because by putrefaction and oxidation this nitrogen, originally contained in the form of complicated bodies, has been reduced to ammonia. The ultimate form of the nitrogen produced by natural decay is always ammonia. In the tropics this is oxidised into nitric acid, if not previously assimilated by plants. Thus is established the theory of the circulation of nitrogen in organic nature.

The action of mould on ammonia is similar to that of charcoal: it condenses this gas, and retains it, so that water does not easily extract it. Clay acts in a similar manner, but less intensely; iron soils do the same. Gypsum also attracts ammonia, but in a different manner; its sulphuric acid combines with the ammonia, its lime with the carbonic acid of the air or soil. Thus gypsum and clay are limited, mould and charcoal unlimited condensers of ammonia. And this function the mould of fertile and barren soils performs so perfectly, that it contains about a thousand times the quantity of nitrogen which the richest vegetation or crop could withdraw from it in any one season.

Thus Liebig showed that "carbonic acid, ammonia, and water contain in their elements all the conditions for the formation during organic life of all animal and vegetable matters. Carbonic acid, ammonia, and water are the last products of the chemical process of their putrefaction and decay. All the countless products of vital power, which are so infinitely different in their properties, regain after death the original forms for which they have been produced. Death, the complete dissolution of a perished generation, is the source of life for a new one."

The origin of the sulphur which is found as a regular constituent of the principal tissues and juices of the animal body, which themselves are derived from the constituents of vegetables, gluten and albumen, Liebig placed in the sulphuric acid of minerals and manures. To this he also ascribed the origin of the materials which go to build up the stimulant and acrid sulphurised principles of mustard, horseradish, leek, onions, and others.

Sulphuric acid in nature is presented to the plants in the form of sulphates, i.e., combined with earth and alkalies, lime, magnesia, potash, soda, and ammonia, never in the free state. These salts enter the plants by the roots; the sulphuric acid is then deprived of its oxygen, and supplied with some hydrogen and nitrogen, and consequently undergoes a process analogous to that by which carbonic acid is assimilated and transformed. The acid character of the new product ceasing, the bases become liberated, or in part combined with the new product. Thus the sulphuric acid entering the plant serves at least two purposes—it supplies sulphur, and carries as it were the bases in combination with it, which then serve other purposes in the vegetable organism.

The phosphorus found in plants, Liebig derived from the phosphoric acid of the minerals of the soil. He believed all phosphorus to be present as phosphoric acid only, in the form of phosphates, of earth and alkalies. He admitted a ratio and mutual dependence between the formation of the albuminous substances and the phosphates. But the true connection escaped his observation, and his idea of the form in which phosphorus was present in the soft tissues of plants and animals, and their juices, was only partially true. The condition in which phosphoric acid, without being reduced or deprived of any of its oxygen, enters into combination with organic alcohols, and aids to form the peculiar ingredients of brain and nerve matter, and of all centres of growth and life, propagating or growing cells, blood-corpuscles, &c., was discovered subsequent to the last edition of his work. He appreciated the discovery highly, but had no opportunity of introducing it into the body of his physiological theory.

Regarding the inorganic or rather mineral, i.e., incombustible, ingredients of plants, Saussure had already maintained their regularity, or constancy of occurrence, and had pointed out that the small quantity in which they occur was no sign of

their uselessness. Liebig enlarged this teaching by many adornments derived from analysis. He showed that the apparent irregularities in the proportions of the bases to each other were all subject to a law, namely, that of substitution by equivalent quantities, so that in whatever proportion metals, calcium, magnesium, potassium, and sodium appeared, the oxygen combined with them was always the same quantity as a sum. He further assigned to the bases a distinct use, which none of his predecessors had done, by showing that they were combined with the various vegetable acids which are met with in all plants, and from the fact of his finding carbonate in the ash of all plants (except those containing much silica), he concluded that all plants contain salts of vegetable acids. He showed that not all the organs of plants can be nourished indifferently by means of any one mineral base, but that leaves, e.g., required much potash at one time, less at another; that in seeds a substitution of potash is not feasible; that some plants can dispense with potash altogether and do with soda, or chloride of sodium, such as the *Salsolas* (or, inversely, the *Salsola kali*), or as was shown by Herapath, the sea-kale, *crambe maritima*. He explained the use of sodium chloride in plant growth by its ability to carry sulphate of lime into the plant, effect a double decomposition within the plant, and allow its chlorine, joined to the calcium of the gypsum, to be excreted by the roots. The excretion of salts not required by the plants by way of the roots he, following Daubeny and Macaire-Priusep, subjected to consideration and application.

By means of this new theory a great number of new facts were discovered, and a great number of facts known for a longer or shorter time explained. Grasses require silica and potash, and, in absence of either, no good crop of grass is obtained. Volcanic rocks, such as basalts and porphyries, by disintegration form soils in which, on account of the silica and potash present, grass grows particularly well. Gypsum may increase a crop of hay, but after some time the effect will be the reverse: potash having been removed more quickly than it can be re-supplied by disintegration of the soil, the growth of grass becomes stunted. Its growth can be again engendered by bringing wood ashes on the meadow. When jungle or primeval forest is burnt the ash forms the material upon which grain crops can be grown for some time in succession, without interruption and without manure.

How assiduously the new light was followed by Liebig and his school, and then by all chemists of the world, is best seen by the list of analyses of the ashes of plants from most genera appended to the first volume of the sixth edition of his work. The most remote, as they appeared, causes of the failure and decay of old crops were shown to be mere want of mineral nutrient. Thus Bunsen proved that the sickness which destroyed so many groves of lemon-trees in Sicily was mere starvation from the absence of mineral food. Grouven proved the same with regard to so-called sick clover (see L. vol. ii. 445 and 446).

Such observations of themselves pointed the lessons which Liebig afterwards shaped for the use of agriculturists. To my mind these lessons follow as a matter of necessity from the established natural laws. But the agricultural mind was not prepared for their reception. They were opposed for twenty years by so-called practical men of no mean order: when they could no longer be opposed they were termed evident truisms.

After a chapter on the formation of arable land or soil—in which there are many most remarkable developments on the properties of silicic acid, the action of the atmospherilia, &c.—Liebig proceeds to discuss the action of the soil with regard to the ashes of vegetables. The soil, when percolated by rain water, retains potash, silica, ammonia, and phosphoric acid so firmly that none appears in the effluent water; if the rain water contained these substances the soil retains them, and the water goes away free from them. Silicate of potash, phosphates of lime and magnesia, in suitable solutions, offered to the soil, are completely retained. Common salt, on the other hand, runs away in the solution; chloride of potassium is decomposed, the potassium is retained, the chlorine goes away combined with calcium. It is thus clear that the salts necessary for the development of plants are retained by the soil, while those which are indifferent in this respect are allowed a free passage.

The observations of Liebig on the cultivation of the soil, on rotation of crops, and on fallowing, are full of interest and information, yielding the keys to secrets which have coerced man's action to his disadvantage for ages. The prominent theses were the following:—

A soil can be termed fertile only when it contains all the

materials requisite for the nutrition of plants in the required quantity and in the proper form.

With every crop a portion of these ingredients is removed. A part of this portion is again added from the inexhaustible store of the atmosphere; another part, however, is lost for ever if not replaced by man.

The fertility of the soil remains unchanged if all the ingredients of a crop are given back to the land. Such a restitution is effected by manure.

The manure produced in the course of husbandry is not sufficient to permanently maintain the fertility of a farm; it lacks the constituents which are annually exported in the shape of grain, hay, milk, and live stock.

The action of animal excrements can be replaced by matters which contain their constituents.

It must be considered as the vital principle of agriculture that the soil has to receive back that which has been taken from it in the crops; the form in which this restitution is made, be it excrement, ashes, bones, guano, or mineral salts, is indifferent. By these sentences the revolutionary teaching became at once productive, and the antagonists of the great teachers, if they did not cease in their opposition, yet all with one thought and will applied themselves to secure for themselves the practical benefits of the lessons which they denounced. They thrived upon it, and have all made fortunes. A vast industry arose in all countries, practising a prescription of Liebig's concerning the transformation of bones and other phosphates into a soluble condition by means of sulphuric acid. The materials pass by thousands of tons, and are known in trade as super-phosphates.

On the other hand, the enterprise in which he engaged about 1845 to supply artificial manures for specific crops failed. This was mainly caused by the introduction since 1846 of guano, which gave immediate results, and thus beat the artificial manures, the effects of which were slow. Liebig did not then know the powers of the soil to retain the plant food, so that water cannot carry it away, and had with the utmost skill so embedded his soluble potash salts in a glassy fused mass that they should come into action slowly and gradually. He had, indeed, with the aid of great labour and misapplied skill, defeated his own most cherished objects. With a lofty freedom of mind he speaks of this false start as a "deplorable, a sad error."

His antagonists now availed themselves of his error as well to discredit his teaching, and there arose what may be termed the "nitrogen period and controversy" in agricultural discussions. As the nitrogen had the practical effects in its favour, the "mineral theory," as they termed it, must, they said, be untrue. We have already seen how, when it could no longer be resisted, it became an evident truism.

These circumstances involved Liebig in a long and frequently fervent controversy, in Germany with Wolff and Stöckhardt, chemists who held prominent places as agricultural teachers; in England with Lawes and Gilbert, equally eminent in practical pursuits and manufactures of manures. Into the merits of these controversies, which attained their climax about 1855 and 1856, I cannot enter, although I have been in a manner challenged to do so. I am mindful of the fable concerning the wager of the cuckoo and the nightingale for the championship of song. The cuckoo proposed the ass for judge, and after the performance the judge decided for the cuckoo, because his melody was choral and kept time. I might by a similar just judgment have acquired a character like that of the judge in this fable, and to avoid this I leave it to the world to make out for themselves which party in these controversies has been cuckoo, which nightingale. At this period it required all the strength of his character, the power of his convictions, the consciousness of the truth of his theories, to sustain him in apparently, if judged by numbers, so unequal a contest. He stood alone, but without intermission continued the thunder of his arguments through the dreary atmosphere of indifference.

Thirteen new chapters (37-50) were added to the "Familiar Letters"; a little book embodied the principles of agricultural chemistry in a short form (1855). Dr. E. Wolff received the attention of a special pamphlet; "Theory and Practice in Agriculture" (1855), discussed the English experiments. Besides, he found time to work on purely chemical subjects, and even to found a new industry by the invention of new methods of silvering and gilding glass, with real silver and gold (1856), inventions which now employ a large capital and many hands in a factory of mirrors at Nürnberg. Gradually support gathered around him; Reuning, the Minister of Agriculture in Saxony,

published (1861) the agricultural statistics of that kingdom, all of which bore out Liebig. Henneberg, one of his former pupils, entered the lists with a critical lecture which had much effect (1858). Stohmann did the same by a publication of great importance (1863), and at last Liebig himself summarised the whole of his knowledge in the sixth edition of this work, the last one he lived to himself accomplish. "I have arrived at a period of life when the atoms of the body express a desire for a metamorphosis. This is an incentive for me to say what I have yet to say before going my way, &c." He then rehearses his doctrines, with all additions, amendments, or expurgations required by the matured state of knowledge, and adds in a second volume the natural laws of husbandry. He now pressed the necessary conclusions from his teaching home to the mind and conscience of the nations for practical application. He put the thesis: The amount of produce of a field is dependent upon the sum of the conditions of fertility contained in it; the duration of the productive power depends upon the maintenance of that sum. The object of the agriculturist, he urged, must be not only to produce the highest return at all, but it must also be to ensure a repetition of this highest return for ever. Therefore, the yield of a field is dependent upon that ingredient plant food which is present, in a suitable form, in the smallest quantity. If one nutrient is increased disproportionately the others are removed more quickly. The selling of the produce of the land, without restitution to the land of the exported mineral matters, is to be esteemed equal to a sale of a portion of the land. Such husbandry must justly be called a kind of robbing husbandry (raubwirthschaft); if it is continued indefinitely in any land it must lead to impoverishment, to sterility of entire countries.

The effects of this word "Raubwirthschaft" are described by Stohmann in a drastic manner. If, he says, formerly there had been lively opposition to Liebig, now the words "robbing husbandry" acted like a spark falling into a barrel of gunpowder. A number of agricultural periodicals got into a paroxysm of screaming fury, mixed with hysterics of the genuine kind; the grossest fools and the most ignorant clowns made free with Thersytian language. To such he utterly disdained replying, nay; he refused to at all read their effusions. To worthier antagonists he replied with a fervour which has been called vehemence. I have even heard it stated, particularly in circles where controversy is eschewed, as capable of betraying weakness, that Liebig had damaged his cause by his vehemence of language. This is highly erroneous. He was a man of the highest moral and intellectual standard, and as you have heard from himself, detested the path of the reptile. To be capable of the prolongation of enthusiasm for the propagation of truth, he must be able to resent misinterpretation of motives and acts. Therefore, his nature, when he was wronged, as often he was, resented with all its power, yet always in a measured manner: as he used to say, "I am going to measure this antagonist with the yard stick of science." And in this process, as far as I know, most antagonists were found too short.

In the second volume of his work, the "Natural Laws of Husbandry," he describes first the laws of the development of the plant in general, of all its parts at all periods of growth. He then collects all evidence accumulated by the experiments of many savants, proving synthetically the truth of his physiology, that is to say, by the growing of plants in merely inorganic media, even in water, to which only the inorganic plant food, without any mould, has been added. He then discusses the soil and its universal properties and all its varieties, and their influence upon plant growth. The third division is given to a consideration of the relations between the soil and the nutrient for plants in the process of manuring. The fourth division discusses the chemistry, use, and economy of stable manure. He shows that most farms are manufactories of manure, for which the materials are taken from one set of fields to be concentrated on another, which is to furnish the produce convertible into money. He shows that this leads to exhaustion of the soil, and insists again and again that the mineral materials exported in the crops, or in the shape of live stock, must be replaced if the fertility of the land is to be maintained. He shows the vast importation into England of corn, meat, bones, guano, oil-sea, ashes, phosphates, ammonia salts, nitre, &c., and how most of the mineral matters thus taken from other countries serve for a time, to be then irretrievably wasted and lost in the streams and rivers of this country in the form of sewage. He predicts the consequences of the exhaustion of the guano deposits, independently of the problem of Peruvian

financing. He passes in review the uses of all manures used or proposed, and shows the value, action, or disadvantage of each as far as they can be measured by general principles. In an appendix he gives a great number of experiments and analyses instituted by various inquirers bearing out his theories.

He says himself that his work must not be considered as a system of agricultural chemistry; such could only be written by an experienced and learned agriculturist. He even points out the aphoristic style by which all his writings are so peculiarly distinguished, a style, indeed, which reminds much of that of Hippocrates; for the beginnings of all knowledge are necessarily incoherent items, which attain cohesion only gradually, as precious stones attain beauty and use only by artistic setting, however great their value in the isolated state.

Thus Liebig roused the intellect of the world to a better appreciation of matters agricultural, and the effect of his teaching, his initiative, his incentive, and his warnings, is felt in a thousand ways in all grades of the social scale in all countries. Agricultural societies and clubs everywhere appointed or employed chemists to investigate scientific questions which most concerned them; manufacturers of manures multiplied everywhere, and they based their manufacture and their sales on the certificates of chemists; everywhere experimental farms or stations were established to continue research, ascertain detail, adapt science to easy practice. The States of Germany in particular founded such agricultural institutes for teaching and research in almost every province and university, and it has now come to pass that even animal chemistry is advanced from the basis of these largely-endowed State institutes in a manner with which medical inquiry will ere long be unable to compete. The iron ores of Spain and other countries are carried to London and Glasgow to have their sulphur burned out for the production of sulphuric acid to serve in the treatment of phosphates; the mines of Stassfurt and Kaluz furnish thousands of tons of potash and magnesia salts, which are used in agriculture all over the globe; the vine grower in the Gironde (I speak from personal knowledge) now draws potash salt from Stanfords to give to his land in exchange for the tartar exported in his wine; the coffee planter of India (I again speak from personal knowledge) now brings super-phosphates and potash salts to his coffee trees, to supply them with what he has exported in his coffee beans. No power of darkness will be able to arrest this intellectual movement, for men have found out its benefits everywhere, apart from the nearly universal conviction of its truth. The Prussian and other German universities now teach students of science and agriculture in great numbers, where thirty years ago law and theology filled the auditories; in that time the number of students of Protestant theology has decreased in Prussia from upwards of 2,000 to less than 800; in Hesse Darmstadt from 50 to 13; one-sixth of all parsonages are without incumbents, because there is no one to accept the appointments. Such is the beginning of the great reformation which is now being wrought in human affairs by science.

Obituary.

AINLIE.—July 29, Mr. Michael Henry Ainlie, chemist and druggist, of Peckham. Aged 50 years.

ATTERBURY.—July 25, Mr. George John Atterbury, chemist and druggist, of Sutton-on-Trent. Aged 70 years.

BAILEY.—July 1, Mr. John Bailey, chemist and druggist, of Tynemouth. Aged 72 years.

BANTER.—July 10, Mr. William Baxter, chemist and druggist, of Leeds Road, Bradford. Aged 37 years.

BLACKLOCK.—July 25, Mr. Joseph D. Blacklock, pharmaceutical chemist, of Old Steine, Brighton. Aged 63 years. Mr. Blacklock had been a member of the Pharmaceutical Society since 1841.

BOYLE.—July 11, Mr. Alfred Boyle, chemist and druggist, of Poplar Dispensary. Aged 35 years.

FISHER.—July 14, Mr. Walter Fisher, chemist and druggist, of Horwich. Aged 33 years.

FOWLER.—July 13, Mr. James Fowler, chemist and druggist, of Warwick. Aged 28 years.

GRAHAM.—July 9, Mr. James Graham, chemist and druggist, of Glasgow.

HOLT.—July 17, Mr. William Henry Holt, pharmaceutical chemist, of Altringham. Aged 35 years.

MITCHELL.—July 25, Mr. Robert Durno Mitchell, pharmaceutical chemist, of Berkeley. Aged 33 years.

SCOTT.—July 8, Mr. Daniel Walker Scott, chemist and druggist, of Sowerby Bridge. Aged 29 years.

STOCKER.—July 15, Mr. Thomas Stoeker, chemist and druggist, of St. Ives. Aged 63 years.

WILSON.—June 28, Mr. William Wilson, pharmaceutical chemist, of Lowther Street, Groves, York. Aged 57 years.



A YORKSHIRE CHEMIST advertises in a contemporary for an assistant in an agricultural business. He adds, "A character for industry and integrity preferred to any pharmaceutical qualifications." That the various graces there alluded to are incompatible is evidently an opinion not entirely impossible.

SOME of the New York druggists have lately commenced to deal in milk and cream for infants and invalids. They guarantee it to be pure and fresh, and to be procured from animals known to be free from disease. We expect this guarantee involves "a slightly advanced charge."

"WELL, Mrs. Grumblin, what's the matter with your grandson?" "Why, Doctor, his throat's very bad. Mr. Parsons, the druggist, says as how there's something wrong with the *bora*; but ye can see for yourself that he have three or four big *ulsters* in his throat, besides which the *jubilee* is much *inflated*."

A NEW ADHESIVE PLASTER.—A mixture of twenty parts of mucilage and one part of glycerine constitutes an excellent shining and supple plaster, far cheaper than the resin and diachylon, and lasting more than a year without deterioration. Three or four layers of the mixture require to be spread over each other on the linen or other stuff, allowing sufficient intervals for the successive layers to dry.

PEANUTS v. OLIVES.—Marseilles annually derives large quantities of peanuts from Pondicherry, which shipments have recently been largely augmenting. In 1874 thirty thousand bags were imported, and in 1875 one hundred and eighty thousand bags. As peanuts are almost unknown as an edible in France, we infer that pressure is brought to bear upon them for the extraction of their oil, which turns up afterwards in our salads and Castile soaps.

A GOLD VARNISH.—Researches made by M. Kayser, of Nuremberg, have shown that a gold varnish, distinguished both by its hardness and beautiful colour, may be obtained by the use of picric and boracic acid. A very pure solution of gum lac should be mixed with picric acid and about half per cent. of crystallised boracic acid, the two acids having been previously dissolved in alcohol. In this way a gold varnish may be prepared, possessing all the advantages of those that are met with in commerce.

CARBOLIC ACID PAPER.—According to the *Engineer*, the carbolic paper which is now used in such quantities for packing fresh meats, &c., for the purpose of preserving them against deterioration by atmospheric or other influences, is made by melting five parts of stearine by gentle heat, and then stirring in thoroughly two parts of carbolic acid, after which five parts of paraffin in a melted form are added. The mass thus prepared is then to be well stirred together, until it cools, after which it is applied with a brush to the paper.

GEO. S. PEDUZZI, a prominent Brooklyn druggist, recently made a successful balloon ascension from the Capitoline grounds. Professor Peduzzi has an idea that the air may be successfully navigated. The New York *Telegram* thinks that "It would be a good thing if the majority of the druggists would follow the Brooklyn gentleman's example and go to ballooning. The sick people would miss that opportunity they now enjoy of getting arsenic for magnesia or laudanum for paregoric."

AMERICAN SODA.—Near to the Great Pacific Railway line, six hundred miles west of Omaha, there is said to be an inexhaustible supply of carbonate of soda in a much purer form than the crude imported ash. In one place there is a surface deposit many acres in extent and 6 feet deep, whilst alkaline lakes and smaller deposits everywhere abound. It is stated that when the branch railroad of about forty miles is constructed the material can be placed in New York to compete with the foreign article, of which England annually exports to the United States a value of one and a quarter millions sterling.

SOFT-SOAPING THE SPIRITS.—At a table-turning entertainment given recently at Leigh, Lancashire, after the manifestations had duly set in, a Mr. Evans, a surgeon, obtained permission to apply a somewhat novel test. He covered the tops of the tables and the fingers of the sitters with a coating of soft-soap, after which every attempt to persuade the table to spin proved ineffectual. This result is said to have spread considerable dismay in the ranks of the spiritualists who were present.

THE PROPERTIES OF GALLIUM.—The recently discovered metal gallium melts at 85° Fahr., so that it liquefies when held in the hand. When solid, the metal is hard and resistant, even to a few degrees below the melting point. It can be cut and possesses a slight malleability. When fused, it adheres easily to glass, on which it forms a beautiful mirror, whiter than that produced by mercury. It oxidises but very superficially when heated to redness in the air, and does not become volatile. The density at 59° Fahr. is 4.7, that of water at 39.2° Fahr. being 1. Excepting mercury, which only becomes solid at 37.9° Fahr., there is no other element which liquefies at so low a temperature as gallium.

A NEW LUXURY.—A Marseilles correspondent informs us that arrangements are being made for supplying London with a substance known as "Marseilles butter." It is produced at a large stearine candle manufactory at Marseilles, where 500 hands are employed and where several tons weight of this substance are turned out weekly, it being known under the names of "Margarine, Graisso alimentaire and Beurre factico." Our correspondent says:—"It is most artistically prepared, equaling in appearance the finest Epping or Dorset qualities, and it keeps well. But it will not go down at Marseilles, and a suitable market is now being sought for this spurious alimentary substance."

THE HONEY HARVEST.—"J. P. J." writes to the *Times* from Bull's Mill, Hertford:—"It may interest your bee-keeping readers to hear what a good year for honey we are having in these parts. I began here in the spring with six stocks of black bees, in large frame hives, and the hives are all now perfectly full of honey and brood (about 50 lbs. each of honey, I should think). Four of them have each given me a super of 45 to 50 lbs. of pure golden comb honey, and are still working hard at in-gathering, and a fifth threw a swarm which, besides filling the large skep it was (in my absence) put into, has stored 4 lbs. to 5 lbs. in a cap at top. I believe the sixth gave a swarm which was lost. The value of honey from these six hives will probably be 15*l.* to 20*l.* (of course, leaving the bees plenty for winter use). I may add that, with the exception of a little stimulative feeding in the early spring and putting the supers on, the bees have had no attention whatever."

HOW TO MAKE LEECHES BITE.—The *Medical Press* quotes the following from *Le Progrès Médical*. We scarcely see how a glass half filled with cold water and leeches can be conveniently applied in all cases, but there may be something in the notion—"In order to make leeches 'take' immediately we should put them into a glass half filled with cold water. We should next carefully bathe with warm water the part to which we wish to apply the leeches, and then quickly apply the glass to the skin. By this means the leeches will attach themselves to the skin with surprising rapidity, the patient merely feeling one single bite. When all the leeches have taken, the glass should be removed in such a manner as not to wet the patient. To accomplish this it will be sufficient to receive the water at the most depending part into a sponge. If we wish to apply the leeches to only a very limited surface, all we need do is to place on the glass previously to its application a sheet of strong paper with a hole cut in it of the required size."

MESSRS. COTTINGHAM & GOGGS succeed Mr. T. Mills at Dartford. Mr. Mills has removed to Handsworth, Birmingham.

WE ARE requested to state that Limousin's apparatus, as sold by Mr. Lauranson, 238 Blackfriars Road, is for scaling the *cachets de pain* (medicated waters), not for making them, as we inadvertently stated last month.

THE FIRM of Tomlinson, Berry & Co., drysalters, Manchester, has been dissolved. Mr. Berry retires, and Mr. J. E. Tomlinson, who has for the last 12 years been a representative of Messrs. Raines & Co., Liverpool, takes his place. The new firm trades under the style of Tomlinson, Tomlinson & Co.



For particulars of Advertisements, Subscriptions, &c., please refer to the first page of Literary matter. An Index to the Advertisements contained in this issue will be found in the front portion of the Journal.

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November, 1874.

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Entirely removes Lead from Water, thus meeting the complaints that arise from time to time as to the presence of Lead in Aerated Waters.

For confirmation of this assertion, see the opinions of such authorities as Dr. BARTLETT, Professor WANKLYN, and others, at page 74 in this Journal.

REDUCTION IN PRICES.

GENERAL MINERAL WATERS DEPÔT, 27 MARGARET STREET, REGENT STREET, LONDON.

THE FORTHCOMING MEETING OF THE BRITISH PHARMACEUTICAL CONFERENCE.

THERE is every prospect of a pleasant meeting for the British Pharmaceutical Conference at Glasgow next month, and there are a few circumstances in connection with it which seem likely to render it notable in the history of these gatherings. Thanks to the hearty zeal and generosity of the local committee, it may with certainty be predicted that visitors from the South will be abundantly rewarded for the toil of the long journey which separates them from the great city on the Clyde. One feature in the arrangements is especially promising. The local committee have secured, at one of the best hotels of the city, not only rooms for the meetings, but also a promise from the proprietor to reserve a number of bed-rooms at moderate prices for members of the Conference, and to provide for the same a special *table d'hôte* each day. This method of bringing the visitors together has been partially carried out on previous occasions, but never so thoroughly as is now proposed at Glasgow. It is the best possible means of fulfilling the second object which the founders of the Conference had in view, namely, To promote friendly intercourse amongst those engaged in pharmacy.

In regard to the scientific feast provided, we are able, through the courtesy of the senior general secretary, to present a preliminary programme of papers which have been already promised. As far as one can judge from the titles and the authors, it may fairly be expected that this meeting will considerably enhance the reputation of the Conference by the development of much pharmaceutical knowledge. Pharmacy, it will be seen, is this year decidedly in the ascendant, and with such a veteran pharmacologist as Professor Redwood for president, little will be left to be desired in this respect. The list which has been furnished to us is as follows:—

1. Mr. Barnard S. Proctor. Liquid Extract of Pareira.
2. Mr. D. B. Dott. Variation in the Strength of the Preparations of Opium.
3. E. L. Cleaver, F.C.S. Report on the Assay of Opium for Morphia.
4. Dr. Wright, F.C.S. New Derivatives from the Opium Alkaloids.
5. Mr. G. Welborn. New Excipients for the Official and other Pill Masses.
6. Mr. T. Haffenden. The Preparation and Preservation of Phosphorus Pills.
7. Mr. A. W. Gerrard. Notes on some Salts of Pilocarpine.
8. Dr. Wright, F.C.S. Report on the Aconite Alkaloids.
9. Dr. Tilden, F.C.S. The Therapeutic Value of the Aloins.
10. J. C. Thresh, F.C.S. The Active Principle of Capsicum Fruit.
11. C. T. Kingzett, F.C.S. Report on the Oxidation of the Essential Oils. Part IV.
12. M. M. P. Muir, F.C.S. Report on the Essential Oil of Sage.
13. Mr. C. Taylor. Note on the Benzoates in Sunt.
14. W. W. Stoddart, F.C.S. Notes on the Colouring Matter of *Crocus Sativus*.
15. T. B. Groves, F.C.S. Pekoe "Flower"—or, Hair of the Tea Leaf.
16. Mr. A. W. Gerrard. A New Form of Plaster of Cantharides.
17. Mr. J. F. Brown. A Proposed Solution of Citrate of Iron and Quinine.
18. R. H. Davies, F.C.S. Preliminary Report on the Chemistry of Ivy.
19. W. L. Howie, F.C.S. Supplementary Note on Phosphate Syrups.
20. Mr. Thomas Greenish, F.C.S. On Filtering Papers.

The most ardent devotees of science who will assemble in our group at Glasgow will not fail to look forward with pleasure to the treat at the end of the programme proper which has been thoughtfully and liberally provided for them by the Glasgow chemists.

The meetings of the Conference are to be held on Tuesday and Wednesday, the 5th and 6th of September. On Thursday, the 7th, very early in the morning, one of the fastest and best saloon steamers on the Clyde will leave Glasgow for a trip up that noble river. It is intended to visit Gareloch, Loch Long, Loch Goil, Holy Loch, Loch Striven, to sail through the Kyles of Bute to Loch Ridden, thence round the Isle of Bute, passing the entrance to Loch Fyne, and getting a near view of the Island of Arran, with its lofty peaks; returning in ample time to allow the members to be present at either of the conversations to be held on that evening by the British Association. Complimentary tickets to English members and other guests will be issued by Mr. Kininmont.

If these items of interest are not sufficient to rouse the English druggist in his den there remains one more. Mr. Fairlie has lately issued a circular announcing that on Friday, the 8th of September, a second meeting of the Chemists' Trade Association will be held at Glasgow, so as to give all present the opportunity of gratifying the one remaining desire of a British heart—a good grumble. This is an excellent arrangement, and will no doubt bring in a good contingent of members from the yonder side of the Tweed. This meeting over, the wearied pharmacist may withdraw to his moors and shoot grouse; or, with his wife and daughters, explore the remaining beauties of Caledonia, stern and wild.

We learn that some pharmaceutical chemists from Ireland may be among the visitors on this occasion. Their presence at the meeting of the Trade Association will be invaluable if they will explain to us how they have managed to bring the British Parliament into such a happy condition of docility and obedience to their wishes.

We should add that intending visitors should write to Mr. A. Kininmont, 69 South Portland Street, Glasgow, the local secretary, who, if they wish it, will engage hotel accommodation for them.

WORK FOR THE TRADE ASSOCIATION.

ONE piece of work, at any rate, the association need not much concern itself with; that is, to reply to those who object to its existence. A few smart paragraphs from the pen of Mr. Reynolds, which we print elsewhere, abundantly dispose of the somewhat weak criticisms with which some members of the Pharmaceutical Council have thought fit to welcome the new society, complementary to, and not competitive with, itself. If the Pharmaceutical Council is indeed going to plunge heartily into the work of advancing trade interests, and Messrs. Atkins and Stacey, who are both, however, somewhat new to their work, assure us of the devotion and energy of their body in this respect, so much the better for the trade. But we need not dissolve the new association on this assurance. If the latter body finds no opportunity of action, it will serve a good purpose by "assisting," in the French sense of the word, at the conflicts in which the council shall engage. But if the guarantees of Mr. Atkins be well-founded, what becomes of the protests to which Mr. Hampson so exclusively referred, and with which we are all familiar, against making the Pharmaceutical Society in any sense a Trade Protection Society? We are not saying which policy is the right one, but we certainly do not understand the right-about-face which seems to have been the latest *mot d'ordre*. Surely the possible "alienation of funds" does not account for it. Mr. Stacey was "surprised" at the resolution sent by the Conference to the council in reference to the dispensing of medicines at

co-operative stores, for he thought it might be regarded as something like a vote of censure. We trust Mr. Stacey will not flatter himself too much on his shrewdness in making this discovery, for we believe that a good many [members of the Conference did intend that meaning to be conveyed to some slight extent. Win or lose, the trade means to do something to prevent its living being sequestered, whether West End pharmacists help them or not.

The event of the past few weeks, the exciting Bravo inquest, has aroused very general attention in regard to the sale of poisons. We have heard this subject discussed within recent days in club-rooms, coffee-rooms, drawing-rooms, railway carriages, omnibuses, and, indeed, wherever men and women by any chance do congregate. Only last week, too, as if to emphasize our point, a member of Parliament announced that he should, next session, introduce a bill to better regulate the sale of poisons. Nothing is more obvious than that the opportunity is coming, even without our seeking, for us, as a trade, to press our reasonable claims upon a not unreasonable Legislature. To those who hold back from a trade association now that this prospect is in view we might apply the reproach of Lady Maebeth:—

Nor time, nor place,
Did then adhere, and yet you would make both :
They have made themselves, and yet their fitness now
Does unmake you.

An organised and representative body, knowing what it wants, and asking only what it is fair to ask for, can do much to secure protection against improper competition when this subject comes before Parliament. For one thing, that will be the opportunity to rectify the present unsatisfactory condition of the patent medicine trade. Five minutes' explanation would be sufficient to convince any member of Parliament of the absurdity of allowing the most deadly poisons to be sold wholesale, retail, and for any purpose, by anybody, anywhere, provided only the Queen's stamp is attached, as a guarantee, so the public believes, of their genuineness, their excellence, and their safety.

The several objects to be attained have been so frequently alluded to in these pages, and were so fully and so ably discussed in the papers and speeches which we reported last month, that it would be quite superfluous for us to go over them again. But apart from anything to be gained, it is very essential to remember what we have to lose. The menaces of jealous doctors and reckless analysts are very actual. Those alone ought to be quite sufficient to induce cordial union. A French wit tells of a prudent man who declared he would never go into the water until he knew how to swim. Such, it seems to us, are those who will not see the necessity of banding themselves together until an actual prosecution is upon them.

Most of the papers read at the Birmingham Conference were of very striking merit, and not the least happy feature about them lay in their argumentative and dispassionate tone. This it is very essential to maintain. "Let no one suppose," we quote from Mr. Reynolds, "that we want an association which will receive five shillings as a subscription and will proceed forthwith to hang all the subscriber's enemies." We have only a right to seek such objects as shall be fair towards the rest of the community. The association will not defend its members from all prosecutions. It will have no sympathy with adulteration, and none with the false assumption of medical titles. It will not go and clamour before the Legislature for peculiar privileges, nor need it constantly be on the look-out for some new agitation. But, if properly supported, it will have a strong arm, which it will use when occasion requires, and more than all the manifest results which it will secure will be the safety obtained for its members from the attacks of would-be enemies, who will be checked in their designs by a wholesome respect for the strength and resolution which it will be recognised to possess.



Editorial Notes

SUBLIMED SALICYLIC ACID.

SOME of the German chemical manufacturers have been trying to produce a sublimed salicylic acid, in the idea that they would thereby be able to present to the medical profession a perfectly pure preparation. Certain practitioners have believed that if they could obtain an absolutely pure article they would avoid the caustic effects on the mucous membranes of the stomach which sometimes occur during the treatment of chronic rheumatism by the internal administration of salicylic acid. According to them the caustic effects were due exclusively to the traces of phenic acid which salicylic acid is liable to contain. The results of chemical experiments are not favourable to the sublimed acid. A substance of a very beautiful appearance is produced, but it is found that the sublimed acid is very much more readily decomposed into phenic and carbonic acids than is the usual crystallised preparation. It is, in fact, impossible to keep it in a pure state after it has once been exposed to the air. It is evident, therefore, that care must be taken to avoid the sublimed acid, as it is so liable to decompose spontaneously, producing an actually poisonous substance. It is said, however, that some Berlin chemists have succeeded in producing an absolutely pure salicylic acid, not liable to this danger, by means of dialysis.

QUICKSILVER.

A "BEDROCK" (whatever that may be) quotation for quicksilver is announced from San Francisco.

The yield of the Californian mines for the year 1875 was fifty-four thousand flasks, more than double that of any previous year; consequently the price, which stood in January, 1875, at \$1.55 per pound, declined up to the month of August to 65 cents, and at the end of September advanced to 85 cents. By the end of the year the price had again receded to 60 cents. Our latest reports give the market rate as 50 cents, which is a trifle under the average of the last 17 years, 53 cents; the lowest price reached in that period was in 1860, 40 cents; and the highest in 1874, \$1.37½. It is thought that even the present low figure is remunerative to the mining companies.

The total production of the Californian mines since their opening has been 740,000 flasks, and the product for 1876 thus far is estimated at 65,000 flasks. It is considered likely that there will be a further decline in the price of five or ten cents per pound.

About one half the world's consumption is therefore supplied by California. It is estimated that the production of the different mines is as follows:—

					Flasks
Almaden (Spain)	..	..	..	..	56,000
Idria (Hungary)	..	..	..	..	8,000
Palatinate (Germany)	..	..	..	..	1,000
Other German Mines	..	..	..	..	1,400
California ..	..	..	..	..	51,000
	Total	..	..	..	120,000

The Spanish mines have been worked since the time of the Carthaginians: their product in modern times has varied from 30,000 to 40,000 flasks annually, and they cannot now be expected to produce much more. There are deposits of quicksilver in South America, but there is no prospect of their being worked for some time. The present consumption of England is

from 45,000 to 50,000 flasks per annum; that of the rest of the world about the same, so that an increase of the Californian production may be expected to produce a further fall in price. The profits of quicksilver mining are unknown to most people not directly interested. Should a lower price pay, not only will none of the mines open at present shut down, but greater cheapness will be likely to result from an increased demand.

PHARMACEUTICAL SPECIALITIES.

SOME two years ago the Viscount Lorgesil, a member of the French Chamber of Deputies, started a crusade against pharmaceutical specialities. He denounced them with almost religious zeal, but instead of advocating, as he was duly bound, their complete suppression, he urged on the Finance Minister the desirability of sharing the plunder which he showed they so abundantly secured. The Finance Minister was quite willing to oblige his friend in this matter, but found it a difficult task to settle exactly what was a pharmaceutical speciality. He thereupon applied to the Academy of Medicine for a definition. They appointed a committee, and after considerable thought they offered to the Minister a suggestion that he should regard as a pharmaceutical speciality every medicament which was advertised in the newspapers, or by any other means. It is not on record that any definition of an advertisement was afterwards requested, but obviously that would have been necessary. What M. Leon Say, however, thought of the Academy's assistance may be gathered from his reply last month in the French Senate to M. de Lorgesil, when the latter gentleman asked why his pet scheme had not been adopted. M. Leon Say assured him that he had no objection to the 36 million francs which the viscount thinks his tax would produce, but his difficulty lay in the choice of a definition applicable to all the products which would fall under such a tax. A wicked senator thereupon suggested that a pharmaceutical speciality might be defined as any medicament which speculated on human stupidity.

THE PHILADELPHIA MOCK DEGREES.

THE adventurer who for some years past has been exploiting the weakness of Britshers and others for a title to improve the name which their godfathers and godmothers gave them seems at last to have played out his well-planned scheme. A recent number of the *Philadelphia Times* gives a report which is satisfactory as far as it goes. This is the paragraph:—

BUCHANAN'S DISAPPEARANCE.—NO NEWS OF THE CANNY SCOTCH FRAUD.—The college on Pine Street is defunct, if college it was that never was a college, but simply a means of swindling. Its head and front was one Dr. Buchanan, a manufacturer of sheepskins for apothecaries ambitious to add an M.D. to their names, lazy wanderers from 'the wilds of Jersey, and all the frauds in Europe of the medical persuasion.

Buchanan is a genius in his own line. Securing a lot of unused and defunct charters, he revived in the person of John Buchanan, M.D., Dean, &c., the American University of Medicine and Surgery at Philadelphia, the Pennsylvania University with a like tail of expletives, such as the Eclectic College, and everything that was lying loose in this sort of defunct medical charters in Philadelphia. Then he advertised all over Europe and America that for the payment of so much—a thesis and proof of one year's study—a diploma could be furnished those who fulfilled the conditions. The conditions never amounted to anything except the fee, \$25, securing a sheepskin in a tin case, enough to enable the purchaser to start a graveyard of his own. The rival schools of the Jefferson and the University combined to expose the fraud, and a committee of the Legislature appointed to investigate the matter reported to that astute body in favour of the repeal of only one of Buchanan's charters, and the eternal wiping out of Dr. Payne, running the Philadelphia College. The Legislature passed Acts making these repeals, and the Pine Street shop went on. The

number of letters that unfortunate Mayor Stokely has been inundated with from all over the world, inquiring about the genuineness of Buchanan's diplomas, passeth all understanding. Received over night and opened in the morning, they for years have supplied columns of stuff to lazy reporters of the smoothing Stokely afternoon type. But now all this is ended.

A *Times* reporter yesterday afternoon dropped into the Buchanan College. The fraud has been performed in an old-fashioned, wide-fronted house. The cellar, according to a sign, is devoted to dental operations. Above it, on the window-sill, is the name of John Buchanan, M.D. Remembrance of the doctor—a little fat man, broad of beam and short of legs, with a fat face surrounded with whiskers close cut under the jaw, a smooth countenance, unmarked by fifty years of time or care, as smooth and seductive as a lawyer's parchment, and as unwrinkled and treacherous as a summer sea—invited the reporter in.

A tall, red-haired Irishman, in a flannel shirt, informed the reporter that Dr. Buchanan would be in in fifteen minutes, and that much time was spent in watching the growth of grass in Washington Square. Then the inquirer returned. A very little negro on this occasion was the door-keeper. "Is the doctor in?" was asked. "Yes, but he is engaged with a patient," answered the infinitesimal son of Ham; "take a seat." In the big front parlour did the *Times* man rest his ever-wearied limbs. Beside him sat a waiting victim intensely interested in other people's investments in the Centennial. He could talk of nothing else. On the mantelpiece were two vases and a terrestrial and a celestial globe, each of the size of a healthy cantelope. The old engraving of Washington's farewell to his generals decorated the eastern wall, flanked on both sides with respectable photographs of respectable old women. The Centennial conversationer had flagged for a space in his speech, when a well-dressed woman passed out of the entry, into which a door from the back first-floor room opens. Then one of the folding doors between the rooms opened, and a tall, fair-haired and blonde-moustached man, the worst imitation of Dr. Buchanan ever attempted, appeared in the waiting-room. "Dr. Buchanan, I believe?" said the *Times* man, inquiringly. "No, sir," was the reply, "the doctor is not in." "Will he be in this afternoon?" "No, he has been sick—has been sick for three weeks." "When will he be in?" "Not for months." And then the reporter, satisfied from his information that the doctor had fled, was content and left.

THE OPIUM HABIT.

SECOND only to the Chinese, our American Cousins are the great opium consumers of the world; not, however, puffing it off in smoke, but absorbing enormous quantities in the form of infinitesimal pills, and made into laudanum. Thousands of persons who recoil with horror from the habitual use of alcoholic stimulants are addicted to that other, and perhaps worse, habit of opium eating. The annual export statistics of opium to the United States, fearfully augmented of late years, supply us with convincing evidence of the extension of this practice. Opiates are largely prescribed by the medical profession, it is true: the consumption of morphia is simply enormous, as evidenced by the sales of any retail chemist, and further by the large quantities manufactured at four or five of the principal chemical laboratories of the country. These being the facts, we are not surprised to notice in the columns of a widely-circulated religious weekly of the States some startlingly sensational advertisements headed "Opium Habit Cured." Dr. Collins, who hails from Indiana, eloquently says, alluding to some of his testimonial letters, we suppose, "They tell of hearts and homes made happy by Dr. Collins." The doctor announces that "he made the discovery of this, the only sure cure for opium eating, in 1868." He prints extracts from half-a-dozen letters, which at least exhibit the fearful quantities taken by the reclaimed previous to meeting with the learned prescriber's specific. One Norton, of Troy, New York, says: "I used 1,200 grains opium per month," and Mollie Duke, of Georgia, consumed the same quantity. Mr. Spaldings, of Kansas City, certifies to having used 1,410 grains per month, while a Wisconsin lady, McCorkle by name, could only drag on existence with 2,040 grains

in the same period of time. A Georgia doctor, Reeves, was compelled to eat 2,160 grains, and as shewing the exhaustive nature of an Ohio banker's occupation we read that Mr. William Sheffield, of Napoleon, used *seven thousand two hundred grains per month*. All the above profess to have been permanently cured.

All these "opium cures" are merely themselves opiates in some disguised form. The "regular" practitioners adopt a similar mode of treatment. The only means, one of them says in an American medical journal, of curing the habit is to deceive the patient by making him believe that he is taking an antidote when he is in reality only taking his usual stimulant, but in gradually diminishing doses. He thus finds himself able to avoid the direct use of morphia or laudanum, and his faith in the remedy grows as the proportion of the drug decreases. The process of cure is, of course, protracted, but that it does answer is abundantly testified. That this is a kind of treatment, however, which essentially requires a skilled attendant is obvious. The quack remedies in which no control over the dose can be exercised are worthless for that reason; and yet, at the same time, it is impossible to explain this to the patient, for if he knew it the imposition which is the chief feature in the treatment would be of no avail. The main hope lies in this:—That the medical profession of the United States will be able so to influence the rising generation of America that the habit shall be checked ere it grows to such a degree as to blight with an almost plague-breath the life and energy of the great Anglo-Saxon race of the western continent.

THE USE OF METHYLATED SPIRIT.

In a General Order, issued by the Inland Revenue Board, dated July 24, 1876, the following paragraph in relation to methylated spirit occurs:—"It is further ordered that in order to prevent the use of methylated spirit in the preparation of medicine for internal use, the respective officers immediately remind all wholesale or manufacturing chemists in their stations that such use of the spirit is strictly prohibited by the Act 29 & 30 Vic., c. 64, s. 8, and that the board do not consider the use of such spirit legal in any medicinal preparations except soap and compound eamphor liniments. Any infringement of the Act should be at once reported to the Board by the supervisor, and a sample of the medicine sent to the laboratory at the chief office." It will be seen from our report of the last meeting of the Pharmaceutical Council that this order has been noticed by them, and that they have undertaken to explain to the Beard the desirability of allowing the use of methylated spirit in the case of the liniments of acorite and belladonna.

PROCEEDINGS OF THE SOCIETY OF PUBLIC ANALYSTS.

It is not our fault that we have to be perpetually repeating the miserable story of incompetence, carelessness, or wilful malice, on the part of the public analysts. And because we refuse to shut our eyes to the disgraceful abuse of justice which is carried on under the aegis of the Sale of Food and Drugs Act we are characterised as the advocates of adulteration, devil's advocates, organ of the adulterators, and such-like epithets. Rather than revile again, we will merely relate one of the most recent displays of analysm. Dr. Bernays, the professor of chemistry at St. Thomas's, is the offender this time. He had received some arrowroot, sold by a grocer in Camberwell, and he certified that it was adulterated with potato flour. The arrowroot had been supplied by Messrs. Hanson & Co., the wholesale grocers, and they, knowing Dr. Bernays' certificate to be incorrect, sent the duplicate sample to Dr. Sedgwick Saunders, the City analyst.

He declared it to be a fine specimen of St. Vincent arrowroot, perfectly pure. Subsequently, Mr. Bell and two other analysts at Somerset House, gave a certificate to the same effect, and then (but unfortunately not until then) Dr. Bernays admitted that he had made a mistake, and tendered an apology. The apology was certainly necessary under the circumstances, but if Dr. Bernays had been a tradesman instead of an analyst an error of that kind might have cost him his situation or perhaps his fortune.

ARTIFICIAL TOBACCO.

THE assistance of nature will soon be entirely dispensed with in the manufacture of tobacco, if we can accept the congratulatory statements of the *Scientific American* on this point.

"Tobacco leaves for the manufacture of Havana cigars," says our contemporary, "are now being produced in New York, thanks to the industry of some of her citizens, aided by the progress of chemical science. The material used is a kind of brown wrapping paper, made of straw especially for this purpose. The paper, after coming from the mill, is saturated with the juice pressed from tobacco stems and other offal; then the sheets are rolled through a machine, which gives them the perfect appearance of the tobacco leaf, and the peculiar spots are printed on them as on calico. The paper thus prepared is especially adapted for wrappers around the cigars, and is such an improvement on the natural tobacco leaf (being much stronger, more economical, and easier of manipulation) that the Havana cigar makers desire no other wrapping for cigars, and import it largely from New York; and no Havana steamer leaves here at present without taking out quantities of it. These figure up, according to some authorities, to 5,000 reams in one cargo, and occasionally as much as 30,000 reams of this artificial tobacco leaf have been exported."

"It is stated that this tobacco-flavoured straw paper makes also a filling superior to the genuine leaf; and it is impossible to detect the delicate film of paper interlapped with some broken leaves of real tobacco in the finished cigar, which the paper so very neatly holds in form. Besides this, the paper leaves no residuum other than a pure light grey or nearly white ash, just like that of the best quality of tobacco."

We doubt if Havana has any longer a mission to fulfil on earth if this be so. It might as well withdraw at once from a world which has ceased to need its existence.

Besides his strictly scientific papers, contributed to various societies and journals, this volume comprises a few of his less severe productions, as, for example, his presidential addresses to the British Pharmaceutical Conferences at Norwich and Exeter, his sketch of the life of Jacob Bell, his essay on the prices of medicines, contributed to one of our almanacs, a few reviews, and such-like articles. It also comprises two memoirs of him, the one being an extension of the article contributed by Mr. Ince to this journal immediately after his death, the other a translation from the German of Professor Flückiger, by Miss Katherine A. Hanbury. A steel portrait as a frontispiece realises Daniel Hanbury most vividly. The articles are freely illustrated, and the publishers have ably supported the editor in producing with good taste what he has so excellently arranged.

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"DISCURSIVE CHEMICAL NOTES IN RHYME," by the author of the "Chemical Review" (London: Van Voorst), is a little pamphlet which anyone with a knowledge of chemistry combined with a sense of humour [Are those qualifications often combined?] will read with enjoyment. The present instalment comprises 123 stanzas, and treats of "The Non-Metallies." We presume, therefore, the author proposes to follow up his idea through the whole range of the science. We have no wish to interfere with his mission, but we rather doubt whether in so doing he will not be likely to strain too much the humour of the notion, which as it stands is excellent. We pick out half-a-dozen of the verses, and assure our readers that they will find the bulk generally equal to sample if they invest a shilling in this clever *jeu d'esprit*:

There have been many Chemistries of late,
For now-a-days each chemist writes a book :
Some have a lucky, some a lackless fate :
If in the street call'd Holywell you look,
You may find various volumes, new and nice,
Vended, with great politeness, at half price.

**

Anomalies are common : Abel will
Doubtless be handed to posterity
For teaching men the readiest way to kill.
A kindly man who would not harm a fly,
With peaceful face and voice as soft as silk,
While fire-eating Wanklyn writes on Milk !

One studies missiles and torpedoes grim ;
The other works on tea and chocolate,
And trauqnil water is a friend to him,
Of which, I think, we've had enough of late.
The man of peace extols the means of slaughter ;
The fighting man is full of milk and water !

**

Referring to Balard's discovery of bromine—

He called it Bromine ; *βρωμός* means a "stink :"
'Tis not a pretty word ; and so 'twere well
To use a language more polite, I think.
What shall we say ? a disagreeable smell.
Bromine is liquid, reddish brown, and weighty
Br its symbol, and its value eighty.

**

Lastly, the amusing allusions to Dr. Frankland's "Notes" and his graphic formulae will awaken a sympathetic echo in the soul of many a worried student :

With h's small and very fat round O's,
Conjointly placed near apoplectic C's
In curious brackets which, we may suppose,
Are only there to irritate and tease.
I gave it up when reading this queer type,
And, growing sorrowful, smoked half a pipe.

Van Voorst may think it splendid ; for we know
The book has a great sale ; and so 'twere well
To haste at once to Paternoster Row
And ask kind John the little work to sell :
John will not care if it be dry or funny.
If you but buy the "Notes" and hand the money.

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WE HAVE RECEIVED a small pamphlet from Professor Gallo-way, of Dublin, which certainly deserves attention. It is



AND

Literary Notes.

A HANDSOME VOLUME of over 500 pages has lately been produced under the editorial supervision of Mr. Joseph Ince, wherein are collected the many scattered papers on scientific subjects written by the late Daniel Hanbury. This volume, in company with the "Pharmacographia," memorialises in a worthy manner that patient, untiring, and most cordially beloved pharmacist. His contributions to the sciences which he most cherished were very important. The characteristic of all his work was its painstaking thoroughness. Conscientiousness is visible in every line that he wrote, and if his writings command but a comparatively small section of readers that is most certainly due to the vast amount of work put into them—work for the reader as well as work emanating from the writer. Hanbury's articles were illustrations of the law of the conservation of energy, and many of them will probably enough be valued more when a future generation is competent to extract from them the energy which he stored up in them.

entitled "A Plan for rendering Salted Meat more Nutritious, thereby Preventing Scurvy." The professor declares that in the process of salting one of the important mineral constituents of fresh meat, phosphate of potash, is removed, and to the absence of this he is inclined to attribute the occurrence of scurvy. He thinks the value of lime juice as a preventive may be due to the minute proportion of phosphate of potash it contains. He would, therefore, have seamen eat phosphate of potash with their food in the same way as we are accustomed to eat salt. Obviously Professor Galloway's theory is little more than a guess, but it seems to have a good basis, and is worth inquiring into.

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In a small book of 64 pages * Dr. Barr Meadows undertakes to expose the errors of homœopathy. He writes smartly, and touches a good many weak places in the *Similia* system, which he characterises as "the modern serpent, like to its predecessor in nothing but the brass." We do not profess to be among the apostles of homœopathy, and we should want an amazing deal more evidence than is yet before us before we could accept Hahnemann's dogma as "God's universal and inflexible law of cure." At the same time we are compelled to remember, as we read Dr. Meadows' little book, that a method of attack like his—the opposition of extracts from various writers, and the distillation of absurdities from their different views—would be as fatal to any other course of medical practice as it is made to appear in regard to homœopathy. Further, we will add in defence of the large body of intelligent men who hold these doctrines, this is hardly the epoch, when the germ theory of disease is being preached from every scientific rostrum, to rail and mock at the alleged effects of very attenuated doses of powerful medicines. Nevertheless it must be admitted that the fantastic theories both of Hahnemann and many of his followers are often capable of being turned into ridicule, and we think some of these writers will be benefited by studying Dr. Meadows' sarcasms.

The author is scarcely just when, in refuting the homœopathic illustration of cow-pox and small-pox, he asserts that "the vaccine virus is the same as the virus of small-pox rendered mild by passing through the system of the cow;" therefore that if vaccination were *curative* and not simply *preventive* this practice would prove that same cure same and not that likes cure likes. It is the modification which the virus goes through which occasions the difference; and how can Dr. Meadows explain what molecular variation causes the modification which he describes as simply being rendered milder? It is true, nevertheless, that this argument, to be of any use to homœopaths, should show that cow-pox is curative, and not preventive only, of small-pox. "Few men," says Dr. Meadows, "have suffered more in the cause of humanity than Edward Jenner. In life the subject of ingratitude and neglect—in death he should at least be free from thus having posthumous honour (?) thrust upon him, and his name emblazoned amongst infinitesimal celebrities as a practitioner of *Similia*. Thus runs the proverb, 'De mortuis nil nisi bonum.'"

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"PRACTICAL NOTES ON THE NEW AMERICAN AND OTHER REMEDIES," by R. Tuthill Massy, M.D. (London: E. Gould & Son, 59 Moorgate Street), is not quite the style of book we should have looked for. It is a small treatise on the various diseases to which we are unfortunately liable, and in recommending treatment for these the author refers rather freely to what are known as "the new American remedies." The suggestions are not exclusively homœopathic, though they are so in most cases. The dogmatic statements throughout the book are frequently open to argument, to say the least; but as the treatise is evidently written for the public that style of writing was no doubt essential. It is almost too bad, however, to bolster up the many impostors which have plagued modern medicine of late, such as condurango, coca, and the like. A little mild doubt in regard to the first is expressed, but the rubbish has no claim to be even named in a book written by a doctor of medicine. What can we expect, however, from a pathologist who can quote with approval in his introductory remarks a remark from "Dr. Hempel" to the effect that it is the physician's right to prescribe his remedies in such doses "as may seem best calculated to strike down the enemy disease

most effectually and quickly." It is not worth while for modern writers to countenance the vulgar notion that disease is an entity, a sort of actual demon which has to be besieged and dispossessed. That is by no means a homœopathic way of looking at the treatment of the human body. What, too, will the high and dry school think of the propriety of introducing into a medical work, under the section on sleeplessness, such an epigram as the following, which, however, is by no means a bad one?—

THE CAUSE OF RIP VAN WINKLE'S LONG NAP.—Dr. Stone, at the last annual gastronomical feast of the Massachusetts Medical Society, explains that "the secret of the Dutchman's somnolence was discovered by a Yankee, who searched under Rip's tattered vest,—

And there he found—no mighty dose
Of powder or of pill,
But vial small, and on its cork,
Decillionth Pulsatill."

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"THE OIL MERCHANT'S AND DRYSALTER'S PRICE BOOK," by W. Stavenhagen Jones (London: Wm. & Thomas Jones & Co., 98 Southwark Street), is likely to be a useful compilation, inasmuch as it contains a very complete list of the goods which might be expected in such a store as that indicated in the title. It is printed on superior paper and is neatly bound. Every right-hand page is left blank, and very faint lines correspond with the printed lines on the opposite page. The only fault we have to find with the book is that these lines are too close together. A "drysaler" will have to be an extremely neat writer to keep such a book thoroughly and completely. For the price charged (3s. 6d.) Messrs. Jones might, we think, have afforded double the space.

SCHOOL OF PHARMACY.

LIST OF PRIZES.

JACOB BELL MEMORIAL SCHOLARSHIPS.

George William Bullen.
George Frederick Gutheridge.

CHEMISTRY AND PHARMACY.

(Five months course).

Bronze Medal Alfred Clay Abraham.

(Ten months course).

Silver Medal Henry George Greenish.

Certificates of Honour { Arthur William Wheatley.
Samuel Newbury.

Certificates of Merit { Thomas Ridgley.
William Champlie Kidd.
Frederick William Place.

BOTANY AND MATERIA MEDICA.

(Five months course).

Bronze Medal Charles Edward Palmer.

(Ten months course).

Silver Medal Henry George Greenish.

Certificates of Honour { Arthur William Wheatley.
Thomas David Wright.
Samuel Newbury.

Certificates of Merit { Augustus Frederick Dimmock.
Charles Edward Stuart.
Thomas Ridgley.
James Hart.

PRACTICAL CHEMISTRY.

Silver Medal Henry George Greenish.

Bronze Medals { William Champlie Kidd.
Samuel Newbury.

Certificates of Honour { Frederick E. Pollard.
Henry Campbell.
Samuel Thomas Severs.

Certificates of Merit { Arthur William Wheatley.
Thomas David Wright.
William Gardner.

Augustus Frederick Dimmock.

* *The Errors of Homœopathy.* Third Edition. London: G. Hill, 154 Westminster Bridge Road.

BOTANICAL PRIZES.

Silver Medal Charles Burton Buck.
 Bronze Medal Albert Henry Cooper.

COUNCIL EXAMINATION PRIZES.

Pereira Medal (Silver) and books value £5.
 Arthur William Wheatley.

Pharmaceutical Society's Medal (Silver) and books value £3.
 Harry Alma Thomas.

Pharmaceutical Society's Medal (Bronze) and books value £2.
 Samuel Newbury.

PHARMACEUTICAL SOCIETY OF IRELAND.

THE monthly stated meeting of the Council of the Pharmaceutical Society of Ireland was held at the College of Physicians, Kildare Street, on Wednesday, the 2nd inst., at four o'clock, Sir D. J. Corrigan, M.D., Bart., president, in the chair. The following members were present: Dr. Aquilla Smith, vice-president, Mr. William Allen, Mr. J. Goodwin, Mr. William Hayes, Mr. J. T. Holmes, and Professor Tichborne.

The following business appeared on the summons of meeting:

I. Notice of motion (Mr. J. T. Holmes):—

"To propose a vote of thanks to George Errington, Esq., M.P., for his exertions in Parliament in procuring for pharmaceutical chemists exemption from jury service."

N.B.—The following letter has been received from Mr. George Errington, M.P., by Mr. William Hayes:—

"House of Commons, July 21, 1876.

"My dear Sir,—I am happy to inform you that the Chief Secretary has agreed to accept my amendment on the Juries Procedure Bill, exempting pharmaceutical chemists from serving on juries. Perhaps you would kindly communicate this to the council of the society.

"I am, your obedient servant,

"W. Hayes, Esq."

"GEORGE ERRINGTON.

The minutes having been read and confirmed, Mr. Holmes proposed a vote of thanks to Mr. Errington, in accordance with his notice of motion, and in doing so remarked that it had been no mere formal matter on Mr. Errington's part. The matter had been pressed in the face of great opposition on the part of Sir M. H. Beach and the Government.

Mr. Wm. Hayes seconded the motion.

The President, in putting the resolution, said he knew personally that Mr. Errington had experienced considerable opposition. The motion was carried unanimously.

In reference to the letter to Mr. Hayes', the president called the attention of the registrar to the informality of its appearing on the summons of meeting, as the bye-laws only provided for the insertion of notices of motion.

Professor Tichborne asked permission to bring forward a resolution of which no notice had been given, namely,—

"That a deputation, consisting of two Dublin members of the council and one residing in Belfast, should be appointed to represent the society at the forthcoming meeting of the Pharmaceutical Conference, to be held in Glasgow early in September, and to invite the Conference to visit Dublin in the year 1878." He explained to the council that it had been the custom, with, he believed, only one exception, for the Conference to meet at the same time and place as the British Association, the solitary exception being in the year 1874, when the British Association met in Belfast, the reason given for this exception being that pharmaceutical matters at the time were unsettled in Ireland, and under those circumstances it was decided to hold the meeting in London. A Pharmaceutical Society had now been established in Ireland. He suggested the names of Mr. Wm. Allen, Mr. J. T. Holmes, and Dr. Whitaker or Mr. Pring, of Belfast, to form the deputation.

Mr. Holmes seconded the motion, and considered it very desirable that the Pharmaceutical Society of Ireland should be represented at the forthcoming assemblage of pharmacists. Nearly every provincial society in England and Scotland was represented, and it would appear very odd if Ireland had not her representatives.

Dr. Aquilla Smith asked was it Mr. Tichborne's intention that the society should pay the expenses of the deputation.

Mr. Tichborne replied in the affirmative.

Dr. A. Smith said under those circumstances he must oppose the motion, as it would entail the outlay of a considerable sum of money by the society, and it would be quite irregular for such

a motion to be allowed to pass without appearing on the notice of meeting, and suggested that the matter might appear for discussion at the next meeting of the council.

Professor Tichborne said that the next meeting of the council would not take place until after the meeting of the Conference.

Mr. Holmes suggested that the money consideration be left out.

Dr. A. Smith still objected to the motion.

Mr. Holmes remarked that if Mr. Tichborne's motion should be negatived it would imply that the council did not think it desirable to be represented at the Conference.

Dr. Smith said he did not put that construction upon it.

Mr. Tichborne said he considered that it amounted to that.

The President said that so long as he was president of the society he should be unwilling to put any motion involving the outlay of money that had not appeared on the summons of meeting—it was a precedent he should not like to establish.

After some further conversation the motion was withdrawn.

A Preliminary examination in connection with the Pharmaceutical Society of Ireland was held on July 3. The following are the names of the successful candidates:—

Patrick James Bacon.
 William Patrick Connolly.
 Leonard Dobbyn.
 Charles Evans.

Michael Hamahan.
 John Hely.
 John Keatly.
 John McMurray.



THE CONCENTRATION OF SULPHURIC ACID.

[TRANSLATION].

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—Mr. Sellon, of the firm of Johnson, Matthey & Co., is resolved to publish all the report which he had got ready in regard to the poor joke of the pretended experiments of his friend Wallace, even though that has now been fully exposed by public discussions and by the adverse decision of the court of law. He thinks that a bad case may always be twisted.

We referred him to a letter of Mr. Wallace's which proves that the failure to work our process occurred only in order to obtain a commission on all the apparatus placed in England: he rejects it, saying that that letter was written by the son. This is true, but as all the letters and the contract were written and signed similarly (we do not even know if Mr. Wallace, sen., can write correctly), it must be, and indeed it has been admitted, that the son, acting as the special translator, was also the agent of the father. If we bring forward his own letter of May 12, 1874, he asserts that it has been badly translated, without pointing out in what respect, and he excuses himself by attributing it to a moment of passing anger. We add—slowly passing—for fifteen months afterwards, on July 2, 1875, he wrote to us again in exactly the same terms, threatening to protect our imitators; and even now it seems that his anger could only be calmed by our consenting to injure his competitors by letting his firm make all our basins.*

Again, we referred him to a contract, not, as he says, simply copied, but corrected and agreed to by him, which he pressed me to sign on the spot, and which allowed him 20 per cent. of the difference between the price of the platinum and that of its sale. He professes that he and his partners did not so understand it, pretending that we offered him 20 per cent. profit, while in reality it was 20 per cent. of our profit; he thus represents us as having made him a monstrous offer. It is unfortunate for his system of defence that his letter of July 25, 1874, acknowledging the receipt of this contract, should have been signed Johnson, Matthey & Co. In short, the letters to which he alludes as showing that he has declined this contract object only, as we have said, to our requirement of a guarantee that they (Johnson, Matthey & Co.), instead of damaging our

* The criticism on the expression "passing anger" would have been very much to the point if only the phrase had been actually employed. On reference to Mr. Sellon's letter, however, we do not discover any expression capable of being so interpreted. We have no wish to prejudice the discussion, but it is our duty to point out an obvious misapprehension of this kind.—ED. C. & D.

process and proposing their own, would recommend it. They make no objection to the 20 per cent. commission, but only to the guarantee required by us. Besides, we do not see how he can harmonise the pretended solicitude of his firm—preferring to sell platinum at cost price rather than burden it with our profits—with the previously quoted passage of his letter of May 12, 1874:—"If you will take all your basins from us, it does not concern us whether your patent exists or not; nor the price for which you may sell your apparatus and services;" the letter of July 2, 1875, adding, "if not, we will inform all the manufacturers that we will furnish them with the basins, and will protect them against whatever you may do." With an adversary who proceeds thus discussion is henceforth superfluous.

He challenges M. Leon Thomas and myself to prove what we affirmed under oath in the Court. Those are truly very gratuitous insults, which, however, in such good company as that of our judges and the whole of the jury, we take lightly. In accepting the challenge we should be as sure to lose as if we accepted that published by M. Lob: "100,000 francs to any one who will prove that my lotion will not make the hair grow." Mr. Sellon was at the trial during the six days that it lasted, and there, seated between his friend Wallace and the defending counsel, he did not cease to whisper to them. Why then, when he himself was put into the witness-box for the defence, was nothing of this said? Why, on the contrary, when asked by the judge, Baron Pollock, if he considered our process a good one, did he answer that it might be good if well set up. To which Baron Pollock replied with this stinging sentence, which gives the gist of this discussion. "You mean, Mr. Sellon, do you not, provided your house furnishes the platinum; for without that, according to your letter, the process is worth nothing at all."

[Our correspondent here enters at great length into a history of his transactions with Messrs. Johnson, Matthey & Co. previously to the occurrence of this disagreement. They are utterly irrelevant to the present issue, and are far too long for publication as mere contributions to history. The essence of the story is simply this:—Mr. Kessler had "imagined" an apparatus for the concentration of sulphuric acid, to be constructed partly in lead and partly in platinum. In 1863 he obtained the assistance of Messrs. Johnson, Matthey & Co. He publishes a series of letters from them down to April 29, 1864, from which it is evident that they had taken great interest and devoted much pains to working out Mr. Kessler's ideas, but that after all the invention turned out a failure. This was exactly what Mr. Sellon stated in his letter last month.—ED. C. & D.]

Mr. Kessler proceeds:—

The announcement of this cheek put an end for the time to our relations. I set to work again for twelve more years, and at last I succeeded—in association with Mr. Faure, with whom I had entered into partnership for the manufacture of sulphuric acid—in surmounting so completely all the difficulties, that not only were the leaden portions of the apparatus no longer attacked, nor the acid brought into contact with any atom of that metal up to its final deposition in the carboys; but the apparatus was found to disseminate vapours less than any platinum alembic. A new patent was taken, and M. Dumas, member of the French Institute, having examined the apparatus at the factory of M. Leon Thomas, was so struck with it that he informed us he would propose it to the Academy of Sciences for the *prix de salubrité*. The Société d'Encouragement, of Paris, also awarded us its gold medal.

After all this, what was my surprise when I read, some months back, in the German edition of Muspratt's "Dictionary of Chemistry," the following article:—

"*Platinum Apparatus with Leaden Dome.*—To lessen expense, to accelerate the concentration, and to facilitate the cleansing of the apparatus, Messrs. Johnson, Matthey & Co. have constructed a leaden dome, which has been employed at the Griesheim Chemical Factory, and which is thus arranged. . . ."

Then follows the exact description of the apparatus tried at London, and not more successful at Griesheim. I confess that this discovery cooled me a little more than ever in regard to making contracts with Messrs. Johnson, Matthey & Co.

As to the inventor of this apparatus, the only name referred to is that of Mr. Wm. Petrie, their consulting engineer. I will add no comment.

Evidently their systematic disparagement is only a commercial cry, and the Wallace trial nothing but a manœuvre. The Petrie apparatus, on which these gentlemen now descant, after

having so impulsively abandoned it for ours before even the latter had been constructed, is an old machine which has never succeeded, and has fallen out of use. We do not think the kind of warfare waged by Messrs. Johnson, Matthey & Co. against us is likely to win them much honour among their customers.

Clermont-Ferrand:

L. KESSLER.

August, 1876.

[If anyone has anything more to say on this subject, it must be expressed with the utmost brevity.—ED. C. & D.]

HOMOEOPATHIC TINCTURE OF PHOSPHORUS.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—In your impartial review of the new Homœopathic Pharmacopœia in your current number you make some remarks from which I infer you are under the impression that the application of the term *mother tincture* to the strongest solution of phosphorus has hitherto been orthodox in homœopathic pharmacy.

Permit me to say that in no British Homœopathic Pharmacopœia is this designation recognised; neither does the American edition of Jahr and Gruner, translated by Dr. Hempel—a work much used formerly by English homœopathic chemists—style it otherwise than as "the first attenuation."

As you will see from the Addenda issued with the first edition of the Pharmacopœia of 1870, the sign ϕ was only applied to solid phosphorus, which was intended to form the starting point of attenuation. Hence the first solution was looked upon as an attenuation, though, unfortunately, this was not distinctly stated in the body of the work. Dr. Quin, in his "Pharmacopœia Homœopathica," published in 1834, speaking of the saturated solution in sulphuric æther, says, "Hujus solutionis bis agitatæ guttas duas in lagenâ cum nonaginta octo spiritus vini guttis comiuisce. Hoc secundam constituit attenuationem." Here the saturated solution evidently was not considered a mother tincture, but appears to have been treated as a strong preparation unlikely to be prescribed in homœopathic practice, and, therefore, not demanding a precise designation.

It will be seen from these facts that the so-called mother tincture of phosphorus has only existed as a private preparation, without the authority of the Pharmacopœia.

I am, sir, yours faithfully,

August 3, 1876.

A HOMŒOPATHIC PHARMACIST.

[Our correspondent seems to justify if not to support our comment. Hitherto, according to him, there has been no clearly defined form for phosphorus tincture ϕ . The Addenda of the first Pharmacopœia does certainly include phosphorus among the medicines respecting which the sign ϕ should mean the crude substances, but one might be excused for fancying that a different law applied to the tincture series. We presume any homœopathic chemist receiving an order for "tinct. phosph. ϕ " would have supplied, without hesitation, the saturated solution, which is now on authority to be called 3x. And we judge also that an order for "tinct. phosph. 3x" until now would have meant an innocent preparation, namely, the above saturated solution diluted with a thousandfold of spirit. Now, as we have said, such a designation indicates the saturated solution. We say this modification involves danger, and gives no adequate compensation in the way of uniformity, inasmuch as the sign ϕ still indicates sometimes the original substance and sometimes a solution or dilution thereof.—ED. C. & D.]

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—While thanking you for your notice of the new edition of the British Homœopathic Pharmacopœia, may I ask you to allow me to correct a misapprehension on your part with regard to phosphorus, that has, no doubt, arisen from a sentence in the preface that "in future there will be no so-called mother tincture," and in a foot-note the "old matrix tincture" is spoken of?

Originally Hahnemann directed the dilutions of phosphorus to be prepared by trituration, consequently regarding crude phosphorus as ϕ . The new 3x tincture of the present edition corresponds exactly in strength with Hahnemann's 3x preparation. So far all would be well, but, unfortunately, for a long time past chemists have been using an irregular preparation of rather

uncertain strength, which some of them most improperly treated as a mother tincture, when in fact no such preparation was authorised. To get rid of this irregular preparation, which was of a different strength from Hahnemann's, in this edition a 3^x tincture is recognised as our strongest tincture. But, inasmuch as this preparation, though not stronger than it ought to be to correspond with the original preparation of Hahnemann, is much stronger than the 3^x prepared from the irregular tincture referred to. Chemists are warned to notice the difference in strength, and to make their calculations accordingly. The difficulty really is in the getting rid of an irregularity. The change will, I believe, be gladly welcomed, and can be made now with far less difficulty than it could at a later period.

The further changes that you have pointed out as desirable would, no doubt, be improvements, but a system has grown up that, however unfortunate, could not be altered without causing an incalculable amount of confusion, which it was not thought expedient to encounter.

Your obedient servant,

W. V. D.

[This letter was received after our remarks on the preceding one had been written. We let all appear, as, to chemists dealing in homœopathic medicines, the phosphorus modification is important.—ED. C. & D.]

MEDICINE AS A BRANCH OF THE CIVIL SERVICE.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—The subject of vested interest in medicine, which we should have expected a few years ago to remain indefinitely quiescent, has so unexpectedly awokened into life, from circumstances with which you are well acquainted, that it requires no foresight to predict that it must become a prominent feature in the questions brought forward for consideration by our trade association. Now one of the probable solutions of our difficulties will be the establishment of medicine and its dependent functions as a government monopoly, and I would urge on my fellow chemists and druggists to accept with due modification this solution. An examination of the Civil Service Guides will convince us that the same amount of capital equivalent necessary to make a man a chemist and druggist would under proper direction secure a clerkship in the Civil Service at a commencing salary of about 200*l.* per annum, and to this may be added the spare time usually employed by civil servants in profitable occupations. We need, therefore, be under no apprehension of submitting to a valuation of our services according to present rates of payment. Moreover, it is no exaggeration to say that the assistant of a chemist and druggist invariably works twelve hours a day and often includes a Sunday. The following are the facts which determine the aspect of medicine as a branch of the Civil Service. Medicine, which of the professions can best stand on its own merits, is thoroughly pauperised by would-be charitable influences. The dispensing we are so desirous of we may likewise expect to be paid for by nominal recognition. Preventive medicine, under present circumstances, does not receive proper attention: medical men and chemists have neither power nor inclination to stop the evil-doings of the fraudulent and ignorant, who directly or indirectly, for gain, add both to our sick list and to our death rate, and who are allowed to treat as unrealities the most widespread but most subtle causes of disease and death.

I am, sir, yours truly,
JOHN BARKER SMITH.

PHARMACY IN THE HAYMARKET.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—Having had my attention directed to some comments in your last issue upon the case of "The Excise v. Guenin and Hermann," it is evident the writer to whom was entrusted the framing of those remarks either was inspired by an utter misconception of the facts or was altogether misinformed as to the facts themselves, and I feel assured the gentleman upon whom devolves the editorial responsibilities of the journal will so far extend to me the courtesy of his columns as to permit me the opportunity of correctly stating the affair therein, and showing in what the said comments are inappropriate.

Firstly. I find these comments involve the following specific

charge:—"That the business has passed into the hands of a new firm, who are successors to the late Mr. E. Rennels Hartnoll, are unregistered, and therefore illegally exercise the functions of chemists, and ought to be prosecuted under the Pharmacy Act."

Now as the business has not passed into the hands of a new firm they cannot be called successors to the late Mr. E. R. Hartnoll, and being represented upon the register conformably both to the letter and spirit of the Pharmacy Act, legally exercise the functions of chemists, and therefore ought not or cannot be prosecuted under the Act. The statement to the contrary is consequently exactly at variance with the truth.

Secondly. The case is described as "a fine imposed at Bow Street Police Court for selling refreshment in the shape of ice cream soda during the small hours of the morning."

The case was purely an Excise prosecution, and had nothing whatever to do with the police. The information upon which judgment was given was laid at 11.15 P.M., and not the small hours of the morning. The "ice cream soda" was not at all vital to the case, the charge being "keeping a refreshment house without a license," and followed the case of "Howe," in which the sale of a bottle of ginger beer was involved.

Thirdly. The magistrate's decision is stated to be fully justified, and that he might be credited with leniency in reducing the fine to the utmost extent.

The fact is it is only in one sense the magistrate gave a decision, for, if I may be allowed the paradox, his decision was a refusal to decide, and may be shortly stated thus:—"The evidence shows this case to be within that of 'Howe and the Inland Revenue,' except that in this case it is a chemist's shop." Then followed a long quotation from the judgment of Lord Justice Mellish to show the same argument applied. "Now," said he, "I hold myself bound by the judgment of my superior court. I cannot make the difference, viz., that of a chemist's shop, ground for a new precedent. Hence a conviction must follow."

The whole question solely turns upon the construction of the word "entertainment" in the Refreshment Act, all the talk of small hours, ice cream sodas, wild regions of the Haymarket, &c., being a mere farrago of nonsense, and having no bearing upon the case whatever. For seven years past the business has been carried on in precisely the same manner.

In the case of "Howe" one of the judges was of opinion that the conviction should be quashed.

No business axiom is better understood by business men than that a business must accommodate itself to the peculiarities of its locality to be a success. When the Haymarket goes in for Morphew at 10 P.M., so will the "chemists of Tichborne Street."

Throughout the whole of the proceedings the politeness and civility of the Excise officials was all that could be wished: they unnecessarily troubled themselves to meet our convenience, and adjourned the case on two or three occasions on their own petition, awaiting the decision in the quoted case of "Howe," so that we might not be prejudiced by a hasty or premature decision; and they also agreed that during the adjournments we should continue to sell the same articles without question as to refreshment license.

In fact, Mr. Editor, I feel convinced, after spending the immense amount of money necessary for counsel's fees, solicitor's charges, &c., in defence of a chemist's right to sell a bottle of soda water after 10 P.M. without the protection of a refreshment license, your vigilant pen would have somewhat reconstructed the phrases of that gentleman of your staff to whom we are indebted for the notice of the case, had I have taken pains to place the proper version of the matter in your hands at an earlier period, and now trust to the proverbial hospitality of your pages to place the matter before your readers in its proper light. I enclose my card, and am

Yours respectfully,
THE MANAGER.

7 Tichborne Street: August 1, 1876.

[The only important error charged against us in this letter is our statement referring to the infringement of the Pharmacy Act. The case appears to be this:—The Excise prosecuted Messrs. Guenin & Hermann. If these gentlemen were not the proprietors of the business at 7 Tichborne Street they were not the proper parties to prosecute, and they might have defeated the Excise on that ground. If they are the proprietors of the business, they are infringing the Pharmacy Act, for their names do not occur in the register. It may be that the defendants were so overwhelmed by the "politeness and civility

of the Excise officials" that they forbore to raise any difficulties; but our readers will not be likely to get up a testimonial to them for their self-sacrificing efforts "in defence of a chemist's right to sell a bottle of soda-water after 10 p.m."—ED. C. & D.]

SPECIMENS OF RURAL PHARMACY.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

DEAR SIR,—I send you a few contributions to your list of synonyms, which have lately been used in my shop.

A swarthy rustic one day asked very boldly for a penn'orth of Scotch canary. After a little study I served him with cochineal, which proved to be the article required.

On another occasion a pert little fellow of about ten summers came in for "a penn'orth of common houseflies." I served him with camomile flowers, and presume it was right, for I have never seen him since. But my brains were taxed even more than this when, about Christmas, 1875, a little girl of nine years came up to my counter and said that she wanted "three-penn'orth of rosy cheeks," but it was not to be Red Riding Hood. After musing awhile upon this enigma, I at length hit upon the thought that the young lady wanted three-penny-worth of rose pink, but it was not to be red ruddle.

Yours very truly,
E. BLADE.

AN ENGLISH GRIEVANCE.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

DEAR SIR,—"Fair Play" is in trouble; he doesn't like the Medicine Stamps Act, and suggests that Irish chemists should ask to be whipped. I am, however, of opinion that it would be of advantage to the trade here if we had a patent medicine license: it would to some extent prevent the underselling of other traders. I am afraid I cannot advise him to ask one of the M.P.'s on the English Council "to simply state the fact," &c.

Yours truly,
ERIN-GO-BRAGH.

THE REWARD OF PATIENCE.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—I have been in the trade now over 25 years. I daresay you would be rather surprised when I tell you that on an average I do not receive more than 30s. per week and board. Of course to a young man I daresay this would be a very handsome salary, but to a man who has a wife and family to keep I think it is only next door to beggary. I do not blame the chemists, but do you think, sir, that it is worth while for a man to spend three or four hundred pounds over his education and apprenticeship and then to receive, after he has spent the best of his strength and years, a salary that many a mechanic would turn up his nose at. Sir, the whole of my complaint shall be condensed in a very few words. I believe very shortly that, unless the assistants of the present day are more liberally remunerated, a great many will turn their attention to other and more lucrative employment. There is another thing I would call your attention to, and that is that a great many of the examinations are practically of no use to the trade, and in many cases totally unfit a man for his business. Apologising for trespassing on your valuable space,

I remain, sir, yours respectfully,
Cranham Street, Oxford : JOHN MASON.
July 21, 1876.

THE CONFERENCE AND THE COUNCIL.

The subjoined letter appears in last week's *Pharmaceutical Journal*:

SIR,—Just a word on the effect which the Birmingham Trade Conference had upon the equanimity of some of our representatives at the late Council meeting.

When the President expressed his regrets "that these gentle-

men who were so eloquent at Birmingham did not come to the annual meeting of the society," he must have forgotten that the Pharmaceutical Society only includes 20 per cent. of the registered members of the trade, and if his invitation should be accepted he may be requested to defray the return travelling expenses of those whom he could not admit to the annual meeting. Surely the trade may meet in Birmingham, if they wish it, without first asking permission from Bloomsbury Square. Let me remark that the meeting was directly representative of 1,200 chemists, a number larger than that of the voters who have conferred his office upon Mr. Williams. On the charge of eloquence made against our speakers, please extenuate this fault of my friends, Mr. Editor. I do not feel that it would be right to retort *tu quoque*.

That the Conference has already had a rousing effect at Bloomsbury Square is thoroughly satisfactory. It is the perpetual cry of "all's well" that we want to get rid of. I will give one fact that should upset a great many of the optimist assertions about the Pharmaceutical Society doing all that it possibly can for the trade. About a year since, a chemist at Leeds was prosecuted for the sale of milk of sulphur, and, as is well known to your readers, after an adjourned hearing, the stipendiary dismissed the case. In this interval, in my capacity of local secretary, I applied to the secretary of the Pharmaceutical Society that if the decision should be against the chemist, we should be authorised to apply for a case for a higher court. I received a refusal, with some compliments upon our powers of self-preservation. Fortunately, the necessity for appeal did not occur.

But, as remarked before, the effect of the Conference has been excellent, and it will probably be but a few years, when the Council, in omitting its September meeting, will bracket the gathering of the Chemists' and Druggists' Trade Association with that of the British Pharmaceutical Conference as the reason.

RICHARD REYNOLDS.

13 Briggate, Leeds : August 8, 1876.

THE SISTER PROFESSIONS.

TO THE EDITOR OF "THE CHEMIST AND DRUGGIST."

SIR,—Allow me through the medium of your wide-spread journal to make known a complaint I received from a medical man in this town. The following is a copy of his letter :

North Street, August 4, 1876.

Sir,—I was called yesterday to see a person for whom it appears you prescribed, after seeing her. You are doubtless aware that this course is illegal: and I trust I may not have to call your attention to any similar case.

Very truly yours,

HENRY J. ASHBURNER.

I immediately called upon my "very truly" friend, Mr. Ashburner, asking the meaning of his letter, as I never left my business to visit anyone, and thought he might have been wrongly informed. He replied, the case alluded to was that a young person had been to my shop suffering from neuralgia, and that I prescribed for her a bottle of liniment, a box of pills, and a mixture, and that I had no legal right in doing so. I said I had been in business thirty years, and was constantly called upon to prescribe for parties who could not afford to have a medical man, and this was the first intimation I had had that I was acting illegally. I added, my neighbour Williams, who had been in the town thirty-six years, was doing the same thing. "Yes," Mr. Ashburner replied, "and I shall give him to understand he must discontinue it."

In this small country town we have no less than four medical men doing their own dispensing. Now if they would adopt the system as in Edinburgh and many other towns, of not dabbling in drugs, we poor hard-working chemists would be too glad to be saved the time taken up in listening to complaints (frequently more or less imaginary), and which we are obliged to prescribe for. I have laid a plain statement of the charge brought against me by Mr. Ashburner, and as I believe almost every chemist and druggist (in the country especially) is doing the same thing, I hope to find the subject ventilated in your columns, in order that we may not be subjected to be ridden rough-shod by surgeons, who ought to value us as a body of chemists.

I am, Mr. Editor, yours truly,
Horsham : August 5, 1876. R. F. MARTIN.

[Does not a fact like this show the necessity of a Trade Defence Association.—ED. C. & D.]



NO MORE GREEK WORDS AS TRADE-MARKS.

In the Chancery Division of the High Court of Justice, on Friday, July 28, an application *ex parte* Stephens was made before the Master of the Rolls, which was of some importance under the Trade Marks Registration Act, 1875.

The applicant, Henry Charles Stephens, recently applied to the Registrar under the Act to be registered as the proprietor of a trade mark, and sent in a statement stating that the trade mark was composed of certain letters in the following distinctive combination:—AEILYTON, which he alleged that he used as a distinctive device for certain inks manufactured by him, and upon his invoices, cards, &c., to describe and distinguish the said inks. The Registrar having refused to register the trade mark in question, on the ground that it was a mere word, and therefore not within the Act, as it had not been used as a trade mark before the passing of the Act, Mr. Stephens now applied that the register might be rectified by inserting his name as proprietor of this trade mark.

Mr. Chitty, Q.C., and Mr. W. C. Fooks, in support of the motion, contended that the word was a "device" within the meaning of section 10, and, as such, capable of registration, quoting, amid some laughter, the authority of Longfellow for the word "Excelsior" being "a strange device," but

The Master of the Rolls said that the Registrar was quite right. The Act defined a trade mark, for the purposes of the Act, to be either the name of an individual or firm printed, impressed or woven in some particular and distinctive manner, or a written signature or copy of a written signature of an individual or firm, or a distinctive device, mark, heading, label, or ticket. And there was a proviso that there might be added to any one or more of these particulars any letters, words, or figures, or combination of letters, words, or figures. It was His Lordship's opinion that the Act did not enable a mere word to be registered unless it had been used as a trade mark before the passing of the Act, which this word had not been. He therefore refused the motion, with costs.

"WORCESTERSHIRE SAUCE."

On July 26, in the High Court of Justice, Chancery Division, before the Master of the Rolls, a bill came on for hearing, filed by Messrs. Lea & Perrins, of Worcester, to restrain the defendant from using the name "Worcestershire" in connection with a sauce made and sold by himself under the style or firm of Richard Millar & Co., such name being claimed by the plaintiffs as exclusively belonging to the sauce manufactured by themselves from a recipe imparted to their predecessors in business by a nobleman of the county about the year 1835.

Mr. Fry, Q.C., Mr. Benjamin, Q.C., Mr. Davey, Q.C., and Mr. William Barber appeared for the plaintiffs; Mr. Chitty, Q.C., and Mr. C. P. Ilbert for the defendant.

The defence was that the name had become common property, having been openly and publicly used by the defendant and other persons in the trade for many years; and, on this being proved to be the fact, the plaintiffs' counsel declined to contest that part of the case any further, and addressed themselves to the subsidiary question, whether the defendant had infringed the plaintiffs' rights by imitating their wrappers and labels. In the result,

The Master of the Rolls said that he was of opinion that the plaintiffs' case wholly failed, and that Messrs. Lea & Perrins would have been better advised if they had not instituted the suit. Many years ago they might undoubtedly have succeeded in preventing other people from infringing their rights as the first makers of Worcestershire sauce, but they had allowed the maxim "Vigilantibus non dormientibus subvenit lex" to become applicable to their case. It appeared to His Lordship to be established that Messrs. Lea & Perrins' pre-

decessors in business either invented or obtained the recipe for an article to which they gave the name of Worcestershire sauce, and that they were the first persons to sell an article by that name. This was about the year 1836, and within a very few, probably not more than two, years afterwards other people, of whom one Batty seemed to be the first, began to sell an article under the same name. Indeed, the name, within a very few years after it was first used by Messrs. Lea & Perrins, appeared to have become a common name in the trade; and, as their own counsel had in the course of the argument abandoned their claim of an exclusive right to the word, he need say no more on that portion of the case. It remained for him to consider the question of infringement with regard to the label pasted on Messrs. Lea & Perrins' bottles prior to November, 1874. That label was printed in black, on a red ground, and contained the words, "Sole manufacturers, Lea & Perrins, Worcester," in bold black type. The defendant's label on his second quality of Worcestershire sauce differed only from the plaintiffs' label in the fact of the words, "Prepared and sold by Proprietors, London," being substituted for the words, "Solo manufacturers, Lea & Perrins, Worcester." No doubt, this label was at some time or other copied from the plaintiffs', but it had been used by other persons as well as the defendant for over thirty years; and His Lordship did not believe that any ordinary person could mistake the one for the other. At all events, it had not been shown or suggested that any person had been so misled. It had been argued that a person who could not read might be misled by the general resemblance between the two labels, but this could scarcely be the case, seeing that the plaintiffs' sauce was sold at 1s., and the defendant's at 6d. or 4½d. per bottle, according to the conscience of the retail dealer. The "proprietors'" label, as it had been termed in argument, appeared to have been in general use in the trade during very many years, and, in His Lordship's opinion, not a shadow of blame attached to the defendant for using a label which nearly everybody in the trade was in the habit of using, and which was kept in stock by at least three printers. Even if the label were an infringement, the Court was not in the habit of intervening unless damage was shown to have been sustained; and His Lordship did not believe that in this case the plaintiffs had sustained any real injury, seeing that the defendant's article was sold in an inferior class of shops and to a lower class of customers than those who were accustomed to buy Messrs. Lea & Perrins' more expensive compound. His Lordship was further of opinion that the plaintiffs had not shown due diligence in prosecuting infringers, and were out of court on that ground. Besides, there was this conclusive answer to the suit, that the plaintiffs had in November, 1874, adopted a new label bearing their own signature as a distinctive mark, and had in the most public manner abandoned the old label, which they now sought to protect. His Lordship then dismissed the bill, with costs.

MORE MILK OF SULPHUR PROSECUTIONS.

At the Gateshead Borough Police-court last month, Mr. Andrew Horner, chemist, West Street, was charged with selling precipitated sulphur, the same being adulterated with hydrated sulphate of lime.

The Town Clerk appeared to prosecute, and stated that the case was taken under the 6th section of the Food and Drugs Act.

The Inspector of Nuisances, Mr. R. Nesbit, stated that on June 10 he went to Mr. Horner's shop and asked for three ounces of precipitated sulphur. He was served with it, and he complied with the requirements of the Act by putting it into three samples, &c. He gave one sample to the analyst, and that gentleman's certificate showed that the sulphur was adulterated by 59·67 per cent. of sulphate of lime.

The defendant contended that he sold the article as milk of sulphur, and that he told Mr. Nesbit he had no precipitated sulphur at the time.—Mr. Nesbit said he asked for precipitated sulphur, and the defendant said milk of sulphur and what he asked for were one and the same thing.—The Town Clerk said there was no such thing as milk of sulphur. It was just a name given to the kind of precipitate sulphur. A case had been settled on the same point at Birmingham.

Mr. Charlton said the defendant had brought himself under the law, though they did not think there was any bad intention. He would be fined 5s. and costs.

Mr. T. W. Lister, chemist, West Street, was charged with a

similar offence.—Mr. Nesbit gave similar evidence to that in the last case. The precipitated sulphur in this case was adulterated with about 60*½* per cent. of sulphato of lime.

The defendant said that he was not at home when the sulphur was sold; it was sold by his young man.—The young man said when Mr. Nesbit came to his shop he told him he had not precipitated sulphur, but that he had milk of sulphur. Mr. Nesbit then said that it was the same thing, and he supplied him with it.

Mr. Charlton said it was usual to give the defendant the benefit of a doubt. There was a conflict in the case and it would be dismissed.

Mr. J. W. Kendall, chemist, High Street, was also charged with selling adulterated precipitated sulphur. In this case the adulteration was 19·8 per cent. The defendant said it was invoiced to him as Howard's pure precipitated sulphur. The defendant was fined 1*s.*, including costs.

DIVORCE CASE.

THE case Woolley *v.* Woolley and Grundy was decided in the Divorce Court last month. It was a petition of the husband, a well-known wholesale druggist, in Manchester, for a divorce from his wife, on the ground of her adultery with the co-respondent, who was on intimate terms with them. The parties were married at Wakefield, on July 27, 1864, and at that time the respondent was a Miss Shepherd, daughter of the Governor of the West Riding Gaol. Afterwards they resided at Brookside, Manchester, and the co-respondent was on most intimate terms with them. The petitioner had no reason to suspect the fidelity of his wife until December 23 last, when, arriving home in the evening to dinner, he found the following note from her:—

"Brookside, Singleton Brook.

"I have deceived you and been false to you, and have left you and my children. Oh! George, me to whom you have given everything—all your love and your life. Oh! if you had cursed me lately instead of giving me so much love and tender care, I could have borne it better; but I cannot go on living this life of deceit any longer. Don't think I am going away to be happy; there will never be an hour when I shall not miss you and the children. God bless you, as He surely will, my own dear, good husband, and bless my dear little ones, and may He make you forget this miserable wretched woman."

After the receipt of this epistle inquiries were made, and, from the statement of counsel, it appeared that the respondent went a little way out of Manchester and then returned. It was now apparent that the respondent and the co-respondent came to London, and the petitioner received a letter from the latter, announcing that they had gone away together, but that he had used no persuasion to induce the respondent to go with him, adding that "it was because she thought it better, however, and wiser to plunge you into sorrow than to live on with you and conceal from you what other people knew. I can't say any more." Eliza Baunres proved that the respondent and the co-respondent lived together at Norbury Crescent, Notting Hill, and Sir Robert Phillimore granted a decree *nisi* for a divorce, with costs, the husband to have the custody of the children, which such an order would effect.

ANOTHER ANALYTICAL BLUNDER.

AT the Lambeth Police Court, on Thursday, July 13, Mr. Charles Davis, of Southampton Street, Camberwell, appeared to answer an adjourned summons from the local authorities for having sold a quarter of a pound of arrowroot which was said by Dr. Bernays, upon analysis, to be adulterated with potato flour, &c. A duplicate sample had been submitted by Messrs. Hanson, Son, Evison & Barker (from whom the arrowroot had been originally purchased) to Dr. Saunders, the City analyst, who pronounced it to be a fine sample of St. Vincent arrowroot, and pure. The case at the first hearing having been adjourned in order that the sample might be examined by the Somerset House officials, a certificate signed by Mr. Bell and two other analysts was now produced, wherein the sample was declared to be pure arrowroot. Professor A. J. Bernays now reported to the sitting magistrate that, since the adjournment, he had re-examined the sample taken from the defendant, and found that he had made a mistake, for which he tendered an apology. Mr. Wontner, on the part of the defendant, made an application for the costs, amounting to 2*s.* 10*d.*, which were ordered to be paid.

LONDON BANKRUPTCY COURT.

FRANK LYON, Druggist and Soap Maker, 59 Watling Street.

The adjudication in this case was made on the petition of Messrs. Wm. A. Scott & Co., merchants, Newcastle-on-Tyne, and at the first meeting debts to the amount of 915*l.* were proved, Mr. W. Dorner, accountant, 33 Moorgate Street, being appointed trustee, with a committee of inspection. The meeting for public examination took place on June 27, before Mr. Registrar Pepys, but no accounts were filed, and the bankrupt did not appear. Mr. Hands represented the trustee. His Honour asked whether the bankrupt had been served with a summons to attend. Mr. Hands said that he had not been personally served, but the summons had come to the bankrupt's knowledge, and he had since promised the trustee that he would attend this sitting. The Registrar directed a memorandum of non-appearance to be entered.

J. P. GARDNER, 42 Claremont Square, Pentonville.

The debtor, now out of business, but described as formerly of 21 Salisbury Terrace, Kilburn, chemist, and late of Kentish Town, filed his petition for liquidation on May 17, and at an adjourned meeting of creditors recently held a composition of 1*s.* in the pound was accepted, payable on September 13 next. On the 6th inst., Mr. W. P. Moore applied to Mr. Registrar Hazlitt for leave to register the resolutions. Mr. Anderson opposed on behalf of Messrs. Brown Brothers, of North Bridge, Edinburgh, creditors for 4*l.* He stated that at the first meeting the debtor produced accounts in which he returned his liabilities at 3,785*l.* 2*s.* 2*d.*, and assets 22*l.* 10*s.*, consisting of an estimated surplus from property in the hands of creditors. On the debtor being examined it was discovered that he had omitted from his accounts property valued at 423*l.* 6*s.* 8*d.*, and the meeting was adjourned. At the adjourned meeting he produced amended accounts, in which the property previously omitted was inserted, but he (Mr. Anderson) submitted that the omission was of too serious a nature to be thus rectified. It was further objected—assuming the Court should hold that the accounts might thus be amended—that the composition of 1*s.* in the pound was inadequate, having regard to the amount of the assets, which showed about 2*s.* 6*d.* in the pound; and upon this point he cited a decision of the Court of Appeal in the case of "*ex parte Page re Page*," where it was held that the power of a majority of creditors to bind a minority must be fairly exercised. He, therefore, asked the Court not to register the resolutions. Mr. Moore, for the debtor, admitted that the accounts were defective in the first instance, but the omission of the property in question was an inadvertent one, and it appeared that it consisted of an interest in property which would only become available at the death of a lady aged 67, and was therefore at present of somewhat doubtful value. He submitted that the composition of 1*s.* in the pound was reasonable under the circumstances. His Honour, after some consideration, thought that the resolutions might properly be registered, and so ordered. The following is a list of the principal creditors:—

		£	s.	d.
A. Robertson, Hoobridge, Melrose	..	2,409	0	0
J. Brown, 5 Brecknock Road, Camden Town	..	254	10	0
— Kirby, 34 Surrey Street, Strand	..	105	0	0
W. G. Tipping, 4 Woodale Place, Brixton	..	84	13	0
— Swallow, 63 Clapham Road	..	83	14	6
E. T. Foster, 106 Maida Vale	..	66	11	10
J. Kay, Stock Exchange	..	60	0	0
Ward & Harston, 9 Tieborne Street, W.	..	53	5	6
Brown Bros., North Bridge, Edinburgh	..	47	0	0
E. Curtis, Three Crown Square, Borough	..	31	4	3
R. B. Beattie, South Castle Street, Edinburgh	..	30	0	0
W. C. Tregilgas, South Street, Andrew Street, Edinburgh	..	30	0	0
W. P. Moore, 89 Chancery Lane	..	25	0	0
E. C. Cosway, 21 Salisbury Terrace, Kilburn	..	23	12	6
Mrs. Maxwell, 126 Brixton Road	..	18	10	8
R. Danby, Montagu Close, Southwark	..	18	4	3
G. Boak, 27 Talma Road, Brixton	..	14	5	0
J. Cadell, 84 Cannon Street	..	15	10	0
Lynch & Co., 171A Aldersgate Street	..	13	9	5
H. Spencer, White Hart Yard, Borough	..	12	1	6
R. Shepherd, Waterloo House, Wimbledon	..	12	0	0
J. Baker, 113 Holborn Hill	..	10	8	9
P. Leonard, 1 Mitre Court, Temple	..	10	0	0

WE HAVE received an excellently illustrated catalogue of microscopes and apparatus connected therewith from Mr. Collins, 157 Great Portland Street, London, W. A specimen of the illustrations occurs in our advertisement pages.



[The following list has been compiled expressly for THE CHEMIST AND DRUGGIST by L. de Fontainemorcan & Co., Patent Agents, 4 South Street, Finsbury, London; 10 Rue de la Fidélité, Paris; and 33 Rue des Minimes, Brussels.]

Provisional Protection for six months has been granted for the following:—

1043. J. Margotti, of Holborou, London. Improvements in stoppers for bottles and jars. Dated March 10, 1876.
2102. J. Mactear, of Glasgow. Improvements in furnaces and apparatus connected therewith for decomposing chloride of sodium or of potassium. Dated May 18, 1876.
2144. J. L. Field, of Broadwater, Sussex. Improvements in drilling or rotatory cutting apparatus suitable for dental operations. Dated May 20, 1876.
2193. H. Codd, of Camberwell, Surrey. Improvements in bottles for containing aerated liquids. Dated May 24, 1876.
2285. R. W. Wallace, of Battersea Park, Surrey. Improvements in the manufacture of sulphuric anhydride and Nordhausen acid, and in the concentration and refining of sulphuric and other acids, and in the apparatus therefor. Dated May 30, 1876.
2308. W. A. Lyttle, of Hammersmith, Middlesex. Improvements in the means and apparatus for exposing solid substances to the action of heat, and also to chemical and absorptive action in relation to gases, vapours, and liquids. Dated June 1, 1876.
2342. J. Longbottom, of Huddersfield, Yorkshire. A new or improved stopper for bottles. Dated June 3, 1876.
2364. J. W. Kirk, of Sunderland, Durham. Improvements in the manufacture of blown glass bottles of every description by forming their shape by rolling instead of by moulds. Dated June 6, 1876.
2454. W. Walker, of Shipley, Yorkshire. Improvements in stoppers applicable to ordinary bottles or other similar articles. Dated June 14, 1876.
2620. G. I. J. Wells, of Widnes, Lancashire. Improvements in the manufacture of soda and potash. Dated June 24, 1876.
2629. E. Collins, of Birmingham. Certain improvements in infants' feeding bottles. Dated June 26, 1876.

Letters Patent have been granted for the following:—

4368. J. L. Ryland, of Birmingham. Improvements in jars, bottles, and other vessels used for containing or transporting oils, varnishes, spirits, and other like fluids. Dated December 16, 1875.
4474. J. L. Pettingale, of New Bond Street, London. New combination of mixtures for digestive purposes. Dated December 23, 1875.
125. W. P. Cherry and C. E. Cherry, of Hull, Yorkshire. Improvements in stoppers for bottles and similar articles, and means for permanently connecting them to the same. Dated January 11, 1876.
274. C. T. Kingzett, of Kensington, and M. Zingler, of Belsize Park, London. Improvements in the production of antiseptics and disinfectants. Dated January 24, 1876.
294. S. Limousin, of Paris. Improvements in the manufacture of medicinal capsules. Dated January 25, 1876.
734. C. Claxton, junr., and C. Claxton, senr., of Lincoln. Improvements in stoppers for bottles for aerated and effervescent liquids. Dated February 22, 1876.
791. E. Breffit, of London, and T. Neville, of Lichfield. Improvements in stoppers for bottles. Dated February 25, 1876.
878. D. Nicoll, of the Strand, London. Improvements in the manufacture of gelatine capsules or cases for containing and preserving food, medicine, and various substances, solid and liquid. Dated March 1, 1876.
985. F. B. Michell, of Truro, Cornwall. Improvements applicable to stoppering and filling of bottles, and drawing off contents of same. Dated March 7, 1876.
1411. H. J. Cole, of Wandsworth Road, Surrey. Improvements in syphon taps for aerated liquid bottles. Dated April 1, 1876.

Specifications published during the month:—

Postage 1d. each extra.

1875.

3644. W. Crosby. Manufacture of lozenges, &c. 1s. 6d.
3731. D. Rylands. Stoppers or covers for bottles and jars, &c. 8d.
3751. T. Sutcliffe and J. Fewings. Bottles and stoppers. 8d.
3804. J. Finney. Preparation for treating cattle disease. 4d.
3891. W. Green. Manufacture of soap. 4d.
3931. J. D. Allatt and J. A. Patton. Stoppering bottles. 8d.
3938. C. Morfit. Dietetic food. 4d.
3955. T. Shaw and W. Blackburn. Dry soap. 4d.
4005. D. Brown. Stoppering bottles. 4d.



BANKRUPTS.

- LEETE, WILLIAM W., 282 Oxford Street, chemist. July 21.
MCCULLOCH, HUGH, 205 Milkwood Road, Brixton, and PERRIN, HENRY, 13 Regent Square, St. Paneras, trading as McCulloch & Co., 9 Mineing Lane, chemicel merchants. August 1.

BANKRUPTCY CLOSED.

- VON SCHMITT, GERARD, 28 Brook Street, Grosvenor Square, M.D.; a composition of 1s. 6d. was accepted by and paid to the creditors. Bankruptcy closed July 13.

PARTNERSHIPS DISSOLVED.

- ATKIN, MILLWARD & CRYER, Manchester, drysalters (so far as regards Eli Atkin).

BORHAM & BORHAM, Leiceester, drysalters.

BOWER, BRAY & BRAY, Huddersfield, oil extractors.

COSGRAVE & CO., Belfast, druggists. June 29. Debts by William Cosgrave.

DAY & GRUBB, Harlow, surgeons.

DIXON & SMART, Grange Road, Bermondsey, surgeons.

FERGUSSON, FERGUSSON & SINCLAIR, Liverpool, chemists.

HAWORTH, HAWORTH & PRIEST, Church, chemists (so far as regards John Haworth).

HILL & BAZLEY, Leominster, veterinary surgeons.

MAPLES, SEN., & MAPLES, drysalters, Kingston-upon-Hull.

MOONEY & LAYCOCK, Leeds, glass bottle manufacturers.

MOORE, ROE & PASS, Bishopsgate Street, aed manufacturers.

TOMLINSON, BERRY & TOMLINSON, Manehcster, drysalters (so far as regards James Berry).

BANKRUPTCIES ANNULLED.

- COHEN, MYLIUS (Sept. 14), 30 Fish Street Hill, manufacturer of chemicals. July 18.

- WALKER, WILLIAM MOTT (June 14), 64 Cardington Street, Euston Square, medical assistant. August 3.

DECLARATIONS OF DIVIDENDS.

- BROWN, ISAAC BAKER (Bkt.), Hendon, Kensington, and Harley Street, surgeon. Second div. 2*½*d.

- JEWELL, THOMAS W. (Bkt.), Harwiche, Essex, surgeon. 8th div., 3s. 8*½*d.

- MITCHINSON, CHARLES C. (Liq.), St. Germain's Terrace, Lee, surgeon. Div. 1s. 8d.; O. Ommaney, 12 Great Winchester Street.

LIQUIDATIONS.

(By arrangement or composition.)

Notices of first meetings have been issued *in re* the following estates. The dates are those of the petitions:—

BANKS, GEORGE HATFIELD, & BANKS, THOMAS PECK, trading as BANKS & Co., Pontymminster Works, Risca, and Machen, Monmouthshire, iron and tin-plate and chemical manufacturers. July 7.

CHEESE, JAMES, Tredegar Place, Newport, Mous., surgeon. August 1.

DAGGERS, FREDERICK, Church Street, Preston, druggist. July 3.

DALE, FREDERICK, Hutton Rudby, Yorkshire, surgeon. July 10.

DYKES, WILLIAM ASTLEY SHERRATT, Clay Cross, Derbyshire, surgeon. July 4.

HOPCROFT, THOMAS FAY, 2 Bar Houses, Beverley, Yorkshire, surgeon. July 11.

HOWE, JOSEPH MASON, Newington, Yorks, chemist. July 31.

JONES, WILLIAM EDWARD, Treorky, Glamorganshire, chemist. July 26.

KERSHAW, JOHN HUGH, Park Road, Bingley, late Halifax, chemist. July 17.

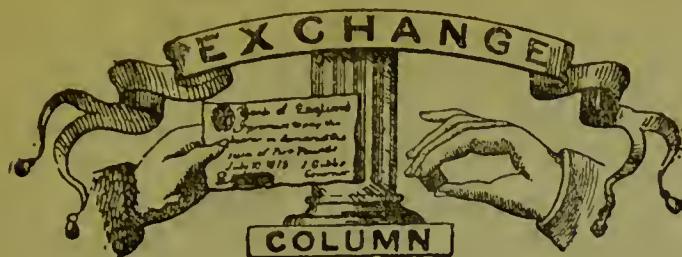
LUNDELL, HENRY WILLIAM ADRIAN, 69 Parrock Street, Gravesend, surgeon. August 1.

MAGILL, WILLIAM S., Embleton, Northumberland, surgeon. July 5.

MCCULLOCH, FREDERICK, McDONALD, ARCHIBALD ARTHUR, and HART, SIDNEY GEORGE, trading as BUTLER, MCCULLOCH & Co., 27 South Row, Covent Garden, and 67 Southampton Row, High Holborn, herbalists and seedsmen. July 27.

STOCKWELL, GEORGE THOMAS, Dunster, Somerset, surgeon. July 27.

TAPP, CHARLES, 1 Clifton Terrace, Doncaster, manufacturing chemist. July 26.



TERMS.—Announcements are inserted in this column at the rate of one halfpenny per word, on condition that name and address are added. Name and address to be paid for. Price in figures counts as one word.

If name and address are not included, one penny per word must be paid. A number will then be attached to the advertisement by the Publisher of THE CHEMIST AND DRUGGIST, and all correspondence relating to it must be addressed to the "Publisher of THE CHEMIST AND DRUGGIST, Colonial Buildings, Cannon Street, London, E.C.", the envelope to be endorsed also with the number. The publisher will transmit the correspondence to the advertiser, and with that his share in the transaction will cease.

FOR DISPOSAL.

Eight pairs of tooth forceps, one key, 5 claws, 15s. 10/236.

Briet's three-pint gazogene, new, price 7s. E. Philp, Martock.

Homœopathic Pharmacopœia, 1876, or will exchange. 12/243.

4 lbs. opium (7 per cent. morphia), cheap. J. R., 37 Milton Street, Newcastle-on-Tyne.

Senna leaves, 28 lbs., 4s. Overstock. Sample if required. Griffith, Coruhill, Bridgwater.

An 80-gallon oil cistern, good as new, very little used; price 25s. Foster, Chemist, Burford.

Pair specie jars, 30 inches, good condition, cost 7l., price 50s. H. Carter, Thornbury, Gloucestershire.

An upright mahogany French-polished glass case, 74 Treble's catalogue, 32 by 30 inches, sliding glass back pediment on top, with gilt lettering. 9 Church Gate, Loughborough.

About thirty wide-mouth brass-capped bottles, for surgery or back shop, 3s. dozen or offers; Thompson's "Dispensatory," 1831, 2s. 6d. Campkin, Cambridge.

Bright spider-wheel bicycle, 50-inch driving wheel, quite new; price 9l., cost 16l. Halford, Chemist, New John Street, Birmingham.

Southall's Materia Medica specimens, never been looked through, 20s. Shower bath, good condition, 25s. W. A. Guy, Shifnal.

Offers wanted; must be cleared at once. Several good oil cisterns and other drysalters' sundries, lying at Banbury, Oxfordshire. Apply to W. Y. S., Steyne Mills, Acton, W.

90 lbs. Plumbe's arrowroot in pounds and half pounds; sells at 1s. 6d. per lb.; clean, never been unpacked. Ferguson, Chemist, Leeds.

Steam engine and boiler, suitable for driving soda water machine. A bargain. Particulars of N. G. Wilcocks, engineer, Back Street, Bath.

To be sold cheap.—Block wood letters, 5½ inches, in gold, "Pharmaceutical Chemist;" *Pharmaceutical Journal*, 212 parts, from March, 1871, to June, 1875, a few missing. J. Clark, 49 Church Street, Sheffield.

To Surgeons and Chemists.—For sale, the contents of a surgery, new and in good condition, viz.:—Surgical instruments and sundries, stoppered bottles, jars, and drawers, with contents. 30/241.

About 40 lbs. tamarinds; 14 lbs. potass. Pruss. flav.; 1 lb. Bismarck brown; soda water stand, 6 holes, mahogany top, 5 shelves underneath, cost 2l. when new; offers requested. 18/63.

A mahogany plate-glass counter case, mirrored back, duplicate bottom, 70 inches long, 20 inches broad, 10 inches high. Price 3l. 10s. (worth 7l.), or would exchange for shorter one. Frederick Gibson, M.P.S., Gooch Street, Birmingham.

Camera and lens (whole plate), stand, printing presses, baths, dishes, glasses, negative box, chemicals, and books on photography, price 15l. 15s. Exchange for shop bottles, counter case, or anything useful. Cooke, Stockbridge, Hants.

A very nice soda-water pedestal, white marble top, 18 in. square, sketch on application, cheap, 25s.; 3 Briet's gazogenes, want a little repairing, 5s. each; 1 dozen 40-oz. N.M. W. stoppered shop rounds, York Glass Co. make, 12s.; 1 dozen 20-oz. ditto, 6s. 35/238.

To be sold.—A range of fittings about 19 feet long, consisting of Spanish mahogany cornice, handsome pilasters, shelving, three nests of drawers, venerated with Spanish mahogany, and an upright glass case for counter. Price for the whole, 20l. Can be seen at Mr. Constance's, 37 Leadenhall Street, E.C.

To be sold by tender. Steam laboratory fittings and utensils, consisting of tubular boiler, fitted with steam and water gauges, safety valve, patent vacuum feed, &c. Two copper-jacketed pans (one fitted with steel head), condenser with worm, cistern, enamelled iron pan in copper jacket, steam stirrer, &c. Also a powerful press. To be seen at Mr. Constance's, 37 Leadenhall Street, E.C.

West's "Diseases, Women," uncut, 1864, 10s.; Churchill's "Manuals;" Erichsen's "Surgery," published 28s., 10s.; Jkey's "Surgery," published 18s., 7s.; Balfour's "Botany," published 12s., 6s.; *Chemist and Druggist*, 1867 to 1875, 15s.; *Pharmaceutical Journal* from commencement, for reasonable cash offer; Cooper's "Surgical Dictionary," published 30s., 7s.; Miller's "Chemistry," 3 vols., 20s., published 50s.; good modern Latin and other Dictionaries. Letters only. M. Percy, 24 Whitcomb Street, Leicester Square, London.

Post free.—Garrod's "Materia Medica," 4s., published 10s. 6d.; Beasley's "Pocket Formulary," 1872, new, 4s. 6d.; Beasley's "Book Prescriptions;" Bell's "Manual Surgery," 1866, 3s. 6d.; Meade's "Apothecaries' Manual," 5s., published 10s. 6d.; Ellis's "Anatomical Demonstrations," 6s.; West's "Diseases, Infancy and Childhood," 6s., published 14s.; Wilson's "Dissector's Manual," 5s.; Dr. Pirrie "On Hay Fever," 1s. 2d.; Wittstein's "Pharmaceutical Chemistry," 2s. 6d., cost 6s.; Gregory's "Handbook Chemistry," 2s. 6d.; "Pharmacopœia Londinensis," 2s. 3d.; Dr. Fletcher's "Railways in their Medical Aspects," 2s. Letters only. M. Percy, 24 Whitcomb Street, Leicester Square, London.

Mahogany (nearly new) superior wall case, 8 ft. 9 long, with silvered plate-glass pilasters, with mahogany cupboards, under 9 ft. high, similar to Maw's fig. 205; two 6 ft. long, one 4 ft. long handsome mahogany wall cases, with mahogany cupboards, under 9 ft. high, as figs. 203 and 204 Maw's; one 10 ft. long nest mahogany gold-labelled shop drawers, with mahogany-faced shelving and cornice above, complete, 9 ft. high, similar to 196 Maw's; 4 ft. 2 long handsome upright plate-glass counter case, as No. 67 Treble's, with plate-glass mirror back and movable shelves, 2 ft. 6 high, 9 in. deep; one 5 ft. 4 long, one 4 ft. 2 long, one 5 ft. long, mahogany wall cases; mahogany window enclosures 11 ft. long, 9 ft. long, 5 ft. 6 long; ten mahogany upright counter cases, with and without desks; six mahogany counter and office desks. Lloyd Rayner, 333 Kingsland Road, London, N.

Cheap. 2 mahogany shop chairs; one mahogany wall case, glass front, 63 in. high, 34 in. wide, 7 in. deep; one nest mahogany drawers, 8 ft. 2 in. long, 2 ft. 7 in. high, with gold labels and glass knobs; one nest mahogany drawers, 8 ft. 9 in. long, 2 ft. 7 in. high, with glass labels and knobs; one outside lamp, with bracket complete, nearly new, coloured glass ("Medical Hall" engraved on); thirty-six narrow-mouth stoppered 20-oz. shop bottles, gold labels; eighteen 10-oz. ditto; ten wide-mouth 40-oz. ditto; ten 20-oz. ditto; twelve blue jars, 32 oz.; twenty-four 8-oz. ditto; one ½-gal. percolator, Y. G. Co. (Limited); one Nelson's inhaler; one 2-gal. iron mortar and pestle; twelve 10-lb. tea caddies, nearly new; one tin cistern with brass tap, 30-gal.; one zinc ditto, 40-gal.; one galvanised iron cistern, screw, 40-gal., wood bottom. Apply to C. Haigh, Holmfirth.

Cheap. Wilson's "Chemistry," revised by Macullum, 2s.; "Principia Latina," Part II., 1s. 6d.; Edward's "Eton Latin Grammar," 1s. 6d.; Smith's "Latin Grammar," 1s. 6d.; Chambers' "Latin Grammar," 1s. 6d.; "Latin Primer," 1s. 6d.; Morell's "English Grammar," 1s. 6d.; "Pharmacopœia Londiniensis," 2s. 6d.; Turner's "Chemistry," 2nd edition, 3s. 6d. J. Roberts, 37 Milton Street, Newcastle-on-Tyne.

Excellent condition.—Miller's "Surgery," 4th, 2 vols., 9s. 6d.; Pirrie's "Surgery," 3rd, 15s.; Cooper's "Surgical Dictionary," bound, 2 vols., 1l. 5s.; Gray's "Anatomy," 5th, 15s.; Wood's "Medicine," 6th, 2 vols., bound, 1l.; Tanner's "Medicine," 6th, 2 vols., bound, 1l.; Tanner's "Clinical Medicine," Fox, 2nd, 5s.; Hartshorne's "Medicine," 3rd, 6s.; Bennett's "Introduction to Clinical Medicine," 4th, 2s. 6d.; Camerou's "Hygiene," 6s.; "Neligan (Belcher) on Skin," 5s.; Astley Cooper's "Surgery," 2nd, 2s. 6d.; Meadows' "Midwifery," 2nd, 5s.; Carpenter's "Manual Physiology," 4th, 5s.; Hoblyn's "Dictionary," 9th, bound, 6s.; Barnes' "Lectures," 2nd, 9s.; Swayne's "Obstetric Aphorisms," 5th, 2s.; "What to Observe," 1s. 6d.; Kennedy's "Scarlatina," 1s. 6d.; Lord's "Physiology," 3rd, 1s. 6d.; Squire's "Pharmacopœia of London Hospitals," 2nd, 2s.; Morgan's "Contagious Diseases," 1s. 6d.; Royle's "Materia Medica," Headland, 3rd, 2s. Dr. Laird, Sligo, Ireland.

48-keyed patent English concertina, by Wheatstone, cost 13l. 13s., price 8l. 15s.; Anglo ditto, cost 63s., price 45s., both new and in perfect order. Large superior musical box, price 3l. 15s.; 1 ditto, smaller size, 25s., four tunes. Galvanic battery, complete, in box, 25s.; magneto-electric machine, 21s.; 1 superb achromatic microscope, in mahogany cabinet, 3l. 3s.; 2 smaller ones, 12s. 6d. and 35s. Dozen good scrap photographs, unmounted, 3s. 6d.; larger ditto, 7s. 6d. Quantity of fine oleographs, for framing; lot on approval, very cheap. Parcel of nursery or screen scraps for 1s. 3d., 2s. 6d., 5s., and 10s. a set; 5 by 4 square mahogany camera and Grubb lens, tripod, &c., cheap; 2 pocket compasses, 4s. 6d. and 4s. 9d.; barometer clock and aneroid, very true, and chaste design, 60s.; small ditto, 20s. 1 doz. glass stereo slides, in case, 30s.; 3 doz. assorted paper slides, 15s.; 1 doz. devilry ditto, 9s. Walnut stereoscope, 8s. 6d.; ditto rack and pinion, &c., 14s. Mahogany graphoscope, 12s. 6d. All the above, carriage free. Further particulars of any of the above truly genuine articles forwarded by Wilkinson, Borough Road, Sunderland.

24 glass globe covered jars, elegantly labelled, gold covers, 11½ in. high, 7s. 6d. each; a pair of specie jars, glass, gold covers, 22 in. high to covers, Royal Arms, almost new, and 4-in. mahogany stands, 90s.; 1 ditto, 25 in. high, 7-in. mahogany stand, 3l.; several others, very cheap; 24 jujube jars, cut knobs, labelled, new, 2s. 9d. each; ointment jars; extract jars; 50 upright and pear-shape, &c., carboys, from 2 to 10 gallons; a pair 10-gallon carboys, cut stoppers, 2-in. solid mahogany stands, 36 in. high without stands, 50s. pair complete; 12 doz. shop bottles, 6s. 6d. doz.; several pair dispensing scales; mortars; brass brackets; glass shelving; 2 plate-glass stands, as Treble's No. 27, very cheap; outside pillar lamp; 30 stock bottles; 4-ft. dispensing screen, Maw's 40; a 4-ft. 6-in. ditto; a 6-ft. 3-in. long dispensing screen, glass case at each end, looking-glass centre, with marble slab in front, very handsome, 8l., a bargain; a 12-ft. bent-glass counter case, 24 in. wide, 8 trays, looking-glass back, almost new, 8l. 10s.; 3-ft. counter case, Maw's 41, 75s.; 4-ft. ditto, 90s.; a 3-ft. ditto, Maw's 100, 45s.; a 5-ft. 3-in. ditto, as Maw's 16, 5l. 10s.; a 6-ft., as Maw's 99; 4-ft., Maw's 101, 90s.; 5-ft., as Maw's 105, 6l.; a 6-ft. ditto, Maw's 105, 7l. 10s.; treble tooth-brush case, Maw's 52, 25s.; stand, No. 55, 75s.; sponge case, Maw's 92, 95s.; soda-water stand, desk and case in front, Maw's 21, 65s.; 4-ft. 6-in. upright case to stand in front of side counter, 12 in. deep 2 ft. 11 high, marble top, glass front and sides, 5l.; fittings of a chemist's shop, drawers, glass knobs, labelled, with shelving over, surmounted by cornice, lockers under, by Treble, a few months since in first-class condition, over 21 ft. run in three sections, 25l. Natali, 213 Old Street, City Road, London, E.C.

Mahogany-top counter, with and without drawers, 15 ft. 6 long, 8l. 10s.; 14 ft. long, 60s.; two 13 ft. long, 7l. 10s. each; one 12 ft. long, 12l.; one 12 ft. long, 4l. 10s.; one 11 ft. long, 3l. 17s. 6d.; one 9 ft. long, 60s.; one 8½ ft. long, 55s.; one 6 ft. long, 35s.; six nests deal dove-tailed counter drawers, fitted for labels, &c., all sizes, from 2 to 12 ft. long; mahogany-fronted gold-labelled shop drawers, with and without lockers under—one 1 ft. 6 long, one 2 ft. 6 long, one 3 ft. 6 long, three 5 ft. long, one 5 ft. 4 long, two 6 ft. long, one 10 ft. long, one 12 ft. long, two 16 ft. long; one 3 ft. 2 long, 17½ in. wide, 7 in. high, flat mahogany counter case, 25s.; one 2 ft. 6 long, 2 ft. wide, 7 in. high, flat mahogany counter case, 21s.; one 1 ft. 8 long, 18 in. wide, sloping mahogany counter case, 12s.; two mahogany flat plate-glass counter cases, 3 ft. long, 8 in. wide, 4½ in. high, 35s. each; one 2 ft. 8 long, 20 in. wide, 4 in. high, flat plate-glass counter case, with trays, 35s.; one 3 ft. long bent-glass counter case, 17 in. wide, 8 in. high, with sloping shelf, as fig. 100 Maw's, 45s.; one 2 ft. 6 long bent-glass counter case, 8 in. high, 8 in. wide, with sloping shelf, as fig. 11 Maw's, 30s.; one 4 ft. long 12 in. wide mahogany bent plate-glass counter case, 8 in. high, with sloping shelves; one 3 ft. 9 long, 16 in. wide, 7½ high, mahogany bent plate-glass counter case, with sloping shelf, as fig. 100 Maw's; soda-water stands, as Maw's figs. 59, 62, and 63; 2 superior label chests, as fig. 26 Maw's; French counter scales, as fig. 4 Maw's, nearly new, 4 lb., 17s.; 10 lbs., 19s.; one set stamped brass weights, 1 lb. to ¼ oz., one set 4 lbs. down to ¼ oz.; dispensing scales, as fig. 7 Maw's; tincture presses, 1 qt., ½ gall., 1 gall.; 6 pill machines. Lloyd Rayner, 333 Kingsland Road, London, N.

WANTED.

Dental show case, with bent-glass front, to fit angle of door. 20/241.

Tincture press and stoppered bottles. Dr. Godfrey, 27 Judd Street, Euston Road, London.

Percira's "Materia Medica," latest edition, good condition; also Squire's "Companion." Wilson, Chemist, Grimsby.

Soda-water machine, pair large globes, specie jars. "Chemist," 34 High Street, Putney, Surrey.

Pharmaceutical Journal for August 7 and October 9, 1875. Longley, Chemist, Leeds.

No. 122, vol. iii., third series, *Pharmaceutical Journal*. J. Clark, 49 Church Street, Sheffield.

Artificial teeth, mounted for show case; also small vulcaniser; cheap; send price. 10/243.

Six 6-gallon and six 10-gallon strong drums. M. Thompson, Bedworth.

7s. 6d. given for best collection of receipts for horse and cattle medicines, known from actual experience to be very effectual. "Dan," 6 Abingdon Buildings, Bath.

Redwood's "Supplement;" Cooley's "Cyclopaedia;" Tanner's "Practice of Medicine," large or small edition. Francis, 185 High Street, Peckham.

White or coloured show jars, as fig. D Maw's, height 10 to 11 inches, must be equal to new, state description and lowest price. To M. S. T., 9 West Derby Street, Liverpool.

Dental instruments and books wanted. Upper and lower molar stump forceps; "Manual Dental Mechanics and Dental Student's Note Book," Oakley Cole's; Richardson's "Mechanical Dentistry;" Robertson's "Manual Extricating;" Tome's "Manual;" latest editions wanted. Andrews, Dentist and Chemist, Pembroke Dock.

Gentlemen retiring from business or having bargains in saleable patent medicines (11s. sizes not objected to), drugs, sundries, or perfumery, should send lowest prices to undersigned, carriage free to London. To save trouble business cards should be enclosed. Large or small quantities. Also wanted a few good fittings. R. Cobden, 207 Western Road, Brighton.

ADDRESSES AND INFORMATION WANTED.

Chemists able to give any information in reply to queries printed below are respectfully requested to communicate the same, addressing in the first instance to the reference figure given, "Care of the Publisher of THE CHEMIST AND DRUGGIST." Charge for insertions, 1d. per word.

Albert Denn, supposed assisting surgeon. 4/231.

Colonel Wood—wounded in the knee at Delhi. 5/222.

Mr. James Hunt, formerly of Clerkenwell. An old friend would like to hear from him. 24/232.

Wanted, the address of Mr. Margetts—tall, sandy whiskers. 22/233.

The Rev. Samuel Richard Dingley, Vernon Spicer Simmonds. 4/230.

Mr. D. Forbes—tall, slight, long black beard; has wife, no family. 15/222.

William Dickinson (Colliery Secretary), late of Leeswood, Mold. 15/243.

J. T. Stillwell—professed to be an agent to the Whittington Life Assurance Company; tall, slight, black whiskers. 14/230.



IT is beyond doubt that a more cheerful tone has been manifested both in the financial and commercial markets since the commencement of the present month. With the evident approach of the end of the Servian struggle, all classes seem to have lost to some extent their suspicions and fears, and there is, to say the least, a general hope of recovery. The increased firmness in the stock markets is especially indicative of this improvement, and a similar feature is reflected in the produce and manufacturing centres. At the same time it must be admitted that statistics do not as yet supply any corroborative evidence, or much reason for congratulation. The official reports of July trade are as discouraging as any which have yet appeared. Our total exports for that month showed the enormous difference of 4,413,231l. between 1875 and 1876, of course to the disadvantage of the latter. The total returns compare thus:—

July, 1875	...	...	...	20,497,618l.
July, 1876	...	...	...	16,084,387l.

It should also be added that July, 1875, was nearly a million behind the same month of 1874. These figures, which tell the same tale month after month, require no comment.

The English chemical trade, though still depressed, keeps quite up to the average of other classes of business. The quantities exported are not generally less than in previous years, but the difference in prices affects seriously the reported values, as well as makers' profits. One of the chief firms in Glasgow have closed their works for three weeks. Trade at the present moment is exceedingly dull, and stocks are very abundant. Bleaching powder has fallen to 5l. 10s. per ton, but forward contracts are not accepted at that rate. A reduction of 1l. per ton in sulphate of copper has sensibly affected the trade in that product, some fair orders having been given. Citric acid has advanced a little, owing to increased firmness in lemon juice; tartaric, however, remains dull. Cream of tartar has somewhat sharply recovered, though there is not much demand for it. Oxalic acid is lower than ever. Sodas and potash are nominally unchanged. Sulphate of quinine is strong, all makers having advanced 6d. during the month. Mercury has fluctuated somewhat, but closes at last month's price, namely, 8l. 10s. per bottle. Borax arrives now in considerable quantities from California—a circumstance which has caused the market rates to decline considerably. Iodine has recovered its latest decline, and again stands at 6d. per ounce. Morphia, in sympathy with opium, has advanced.

At the drug sales on Thursday last prices showed but little variation, and the demand was of quite a limited character.

Cardamoms were prominently brought forward, and were parted with at slightly reduced figures. *Cocculus indicus* and *China root* were also cheaper. Some good Cape aloes were sold at 46s.; Barbados were bought in at prices ranging from 5l. 10s. to 7l. 5s. *Copaiba balsam* has been largely offered, but not much business has occurred, holders wanting 2s., while dealers refuse to advance on 1s. 10d. Balsam of tolu was bought in at the high price of 11s. 6d. Barks sell well at full prices. No East India bark has been offered lately. Four bales of New Belgian eamomiles sold at 5l. The English crop is said to be very poor this season. No dealings in camphor, which remains at previous moderate rates. Saffron is becoming very scarce, and high prices are now demanded. Castor oil has sold better, and is returning to its normal prices. Almond oil still advances, and now sells at 1s. 6d. Cod liver is still scarce, and is held firmly for advanced prices. The Hudson's Bay Company sent 253 lbs. of castoreum to the sales, the best making 22s., common sorts bringing 8s. 9d. and 9s. The same company also sent 142 lbs. of isinglass, which sold at 3s. Opium is universally expected to advance to a much higher price, and we hope many of our readers have taken our advice in respect to this drug, frequently repeated during the winter and spring. The reports of bad crops so freely circulated are, however, probably exaggerated. Some moderate quality of Spanish liquorice root sold for 12s. 6d. to 13s. Vanilla is still a little easier. Hotchkiss's peppermint, 1s. higher. Some wintergreen oil of the same maker was bought in at 13s. 6d. The season is said to have been unfavourable for English peppermint, both as regards quality and quantity. Rose leaves are also reported to be below the average, and fine samples of otto are realising advanced rates. Pellitory root, which has been absent from the market for some time, has again made its appearance, and sold for 64s.

OILS.—Some excitement has occurred in respect to linseed oil, which a fortnight ago was forced up to 26l., but is now sold at the rate of 24l. 7s. 6d. to 24l. 10s., spot. September-December, 23l. 12s. 6d., but January-April deliveries are still obtainable at 23l. 15s. Rape has maintained an upward tendency, English brown having been sold in quantity at 35l. to 35l. 5s. on the spot, and September-December at 35l. to 35l. 5s. English refined on the spot, 37l. to 37l. 5s. Cotton oil has been rather more required for; crude has found buyers at 25l. 5s. Refined is now worth 29l. 5s. to 29l. 10s. on the spot here, and 27l. 17s. 6d. in Hull. Olive oils have continued in demand: small sales of Corfu on the spot have been made at 42l. 10s. 100 tons Messina sold to arrive at 42l. 15s., and a cargo of Tunis, July shipment, at 39l. 10s. Gallipoli is obtainable at 45l. 10s., and Gioja at 44l. 10s. Cocoanut has continued steady, but without business of importance, at 39l. to 40l. for Cochin, 37l. Ceylon, and 30l. to 36l. 10s. for Sydney. 48 casks Ceylon offered by auction were bought in at 37l. Palm has moved off slowly at 36l. to 36l. 10s. for fine Lagos. 114 tuns fish oil were sold last week by the Hudson's Bay Company at prices ranging between 30l. and 31l. The market for crude sperm continues inactive at 84l. Southern whale is nominal for want of supplies. In seal there is little doing at 30l. to 33l., according to quality. Cod is in more demand, and firmer; 100 tuns have been recently sold at 43l., but 44l. is now required.

American turpentine is steady at previous rates. A strong demand for petroleum during July has caused the price for crude and refined to advance considerably. It is now quoted 1s. 1½d. to 1s. 1¾d.

Shellac, after a period of further flatness, has recently rallied, and closes firm at last month's rates. Cochineal has sold generally at about 1d. per lb. cheaper. Canary seed is much lower. China soy is also cheaper.

MEDICAL AUTHORITIES declare that salicylic acid will prove to be a valuable antiseptic in most skin diseases. If this be so we are satisfied that the "Salicylic Soap" just introduced by Messrs. Tidman & Son will become both popular and useful. It is a very pleasant soap to use, and is quite devoid of anything like acrid properties. It is sold in 1s. tablets, each enclosed in a little box prettily labelled.

WE HAVE also received a preparation entitled "Salicylin Dentifrice Water," prepared by Mr. Heath, homeopathic chemist, of Ebury Street, S.W. We should think this is likely to be useful in preventing decay of the teeth and in purifying the breath.

Monthly Price Current.

The prices quoted in the following list are those actually obtained in Mincing Lane for articles sold in bulk. Our Retail Subscribers must not expect to purchase at these market prices, but they may draw from them useful conclusions respecting the prices at which articles are offered by the Wholesale Firms.

CHEMICALS.

1876.

1875.

ACIDS—	s. d.	s. d.	s. d.	s. d.	s. d.
Acetic	per lb.	0 3½	to	0 0	0 4 to 0 0
Citric	"	2 9	..	0 0	3 1 .. 0 0
Hydrochlor.	per cwt.	5 0	..	7 0	4 0 .. 7 0
Nitric	per lb.	0 43	..	0 0	0 5½ .. 0 0
Oxalic	"	0 43	..	0 0	0 6 .. 0 0
Sulphuric	"	0 03	..	0 1	0 03 .. 0 1
Tartaric crystal..	"	1 4	..	0 0	1 6½ .. 0 0
powdered ..	"	1 4	..	0 0	1 6½ .. 0 0
ANTIMONY ore	per ton	280 0	..	300 0	260 0 .. 300 0
crude ..	per cwt.	42 0	..	0 0	40 0 .. 0 0
star	"	59 0	..	61 0	59 0 .. 60 0
ARSENIC, lump	"	27 6	..	28 0	30 0 .. 0 0
powder	"	11 0	..	0 0	14 0 .. 0 0
BRIMSTONE, rough	per ton	126 10	..	150 0	0 0 .. 0 0
roll ..	per cwt.	10 0	..	10 3	10 0 .. 11 0
flour ..	"	13 0	..	14 0	12 10 .. 13 0
IODINE, dry	per oz.	0 6	..	0 0	0 7½ .. 0 0
IVORY BLACK, dry ..	per cwt.	8 6	..	0 0	8 6 .. 0 0
MAGNESIA, calcined ..	per lb.	1 8	..	0 0	1 6 .. 0 0
MERCURY	per bottle	170 0	..	0 0	190 0 .. 195 0
MINIUM, red	per cwt.	0 0	..	0 0	21 0 .. 25 6
orange ..	"	37 0	..	0 0	37 0 .. 0 0
PRECIPITATE, red ..	per lb.	4 1	..	0 0	4 8 .. 0 0
white ..	"	4 1	..	0 0	4 7 .. 8 0
PRUSSIAN BLUE ..	"	0 0	..	0 0	0 0 .. 0 0
SALTS—					
Alum	per ton	140 0	..	150 0	155 0 .. 160 0
powder	"	160 0	..	0 0	170 0 .. 0 0
Ammonia :					
Carbonate	per lb.	0 5	..	0 5½	0 7 .. 0 7½
Hydrochlorate, crude,					
white	per ton	560 0	..	700 0	640 0 .. 0 0
British (see Sal Am.)					
Sulphate	per ton	380 0	..	390 0	365 0 .. 375 0
Argol, Cape	per cwt.	80 0	..	87 0	88 0 .. 95 0
Red	"	70 0	..	75 0	80 0 .. 98 0
Oporto, red. ..	"	33 0	..	34 0	34 0 .. 36 0
Sicily	"	0 0	..	0 0	60 0 .. 62 6
Ashes (see Potash and Soda)					
Bleaching powd... per cwt.		5 6	..	0 0	8 9 .. 9 0
Borax, crude	"	30 0	..	40 0	30 0 .. 53 0
British refund. ..	"	43 6	..	0 0	53 0 .. 0 0
Calomel	per lb.	3 7	..	0 0	4 2 .. 0 0
Copper :					
Sulphate	per cwt.	22 0	..	0 0	25 6 .. 25 9
Copperas, green	per ton	55 0	..	60 0	65 0 .. 0 0
Corrosive Sublimate p. lb.		3 0	..	0 0	3 6 .. 0 0
Cr. Tartar, French, p. cwt.		106 0	..	107 0	112 0 .. 0 0
brown	"	80 0	..	82 6	92 6 .. 98 0
Epsom Salts	per cwt.	5 3	..	7 0	6 6 .. 0 0
Glauber Salts	"	4 6	..	5 6	6 6 .. 0 0
Lime :					
Acetate, white, per cwt.		11 0	..	20 0	11 0 .. 20 0
Magnesia : Carbonate ..	"	45 0	..	0 0	42 6 .. 0 0
Potash :					
Eichromate	per lb.	0 41	..	0 0	0 6½ .. 0 0
Carbonate :					
Potashes, Canada, 1st					
sort	per cwt.	24 0	..	0 0	28 6 .. 29 0
Pearlashes, Canada, 1st					
sort	per cwt.	28 6	..	0 0	39 0 .. 0 0
Chlorate	per lb.	0 8½	..	0 0	0 9½ .. 0 9½
Prussiate	"	0 10½	..	0 11	1 0¾ .. 0 0
red	"	3 2	..	3 3	3 2 .. 3 3
Tartrate (see Argol and Cream of Tartar)					
Potassium :					
Chloride	per cwt.	7 0	..	0 0	7 0 .. 0 0
Iodide	per lb.	7 6	..	0 0	10 0 .. 0 0
Quinine :					
Sulphate, British, in					
bottles	per oz.	7 8	..	0 0	7 0 .. 0 0
Sulphate, French	"	7 3	..	0 0	6 6 .. 0 0
Sal Acets	per lb.	0 7½	..	0 0	0 8½ .. 0 0
Sal Ammoniac, Brit. cwt.		44 0	..	45 0	44 0 .. 45 0
Salt-petre :					
Bengal, 6 per cent. or					
under	per cwt.	17 3	..	18 3	18 0 .. 18 9
Bengal, over 6 per cent.					
per cwt.		17 0	..	17 6	17 0 .. 17 6
British, refined ..	"	21 6	..	22 9	22 0 .. 23 0
Soda: Bicarbonate, p. cwt.		10 9	..	0 0	12 9 .. 13 0
Carbonate :					
Soda Ash ..	per deg.	0 1½	..	0 1½	0 2½ .. 0 0
Soda Crystals per ton		80 0	..	0 0	97 6 .. 0 0
Hyposulphite, per cwt.		0 0	..	0 0	0 0 .. 0 0
Nitrate	per cwt.	11 3	..	11 6	11 3 .. 11 9
SUGAR OF LEAD, White cwt.		38 0	..	0 0	44 0 .. 0 0
SUGAR OF LEAD, Brown, cwt.		27 0	..	0 0	32 0 .. 0 0
SULPHUR (see Brimstone)					

VERDIORIS	per lb.	1876.		1875.	
		s.	d.	s.	d.
		1	1	1	5
VERMILION, English ..	"	3	2	3	4
China ..	"	0	0	0	0
DRUGS.					
ALOES, Hepatic	per cwt.	60	0	60	0
Socotrine ..	"	65	0	80	0
Cape, good ..	"	43	0	34	0
Inferior ..	"	36	0	32	0
Barbadoes ..	"	45	0	187	6
AMBERGRIS, grey ..	oz.	58	0	65	0
BALSAM—					
Canada	per lb.	1	2	1	9
Capivi	"	1	9	2	10
Pern	"	5	0	6	0
Tolu	"	0	0	5	0
BARKS—					
Canella alba	per cwt.	26	0	16	0
Cascarilla	"	16	0	19	0
Peru, crown & grey ..	per lb.	1	2	2	9
Calisaya, flat ..	"	2	0	4	6
" quill ..	"	2	0	2	0
Carthagena ..	"	1	5	0	6
Columbian ..	"	1	0	3	4
E. I. ..	"	2	0	1	0
Pitayo ..	"	0	7	0	4
" Red ..	"	1	9	1	6
Buchu Leaves ..	"	0	1	0	1
CAMPHOR, China ..	per cwt.	63	0	67	6
" Japan ..	"	65	0	0	0
" Refin. Eng. ..	lb.	0	11½	1	0½
CANTHARIDES ..	"	2	6	3	0
CHAMOMILE FLOWERS p. cwt.		40	0	35	0
CASTOREUM	per lb.	7	0	6	0
DRAGON'S BLOOD, lp. p. cwt.		110	0	200	0
FRUITS AND SEEDS (see also Seeds and Spices).					
Anise, China Star ..	cwt.	85	0	110	0
" Spanish, &c. ..	"	26	0	30	0
Beans, Tonquin ..	per lb.	1	7	1	5
Cardamoms, Malabar					
" good ..	"	3	5	4	0
" inferior ..	"	0	10	1	9
" Madras ..	"	2	0	2	6
" Ceylon ..	"	4	0	5	8
Cassia Fistula	per cwt.	8	0	12	6
Castor Seeds ..	"	5	0	10	0
Coccus Indicus ..	"	9	0	11	0
Colocynth, apple ..	per lb.	0	6	0	6
Crotou Seeds	per cwt.	32	0	40	0
Cubeb ..	"	29	0	25	0
Cummin ..	"	15	0	15	0
Dividivi ..	"	10	0	12	0
Fenugreek ..	"	15	0	8	0
Guinea Grains ..	"	21	6	23	0
Juniper Berries ..	"	8	0	9	0
Nux Vomica ..	"	8	6	7	9
Tamarinds, East India ..	"	13	6	20	0
" West India ..	"	11	0	10	0
Vanilla, large ..	per lb.	20	0	57	0
" inferior ..	"	13	0	38	0
GINGER, Preserved ..	per lb.	0	5½	0	6
HONEY, Chili ..	per cwt.	0	0	31	0
" Jamaica ..	"	35	0	38	0
" Australian ..	"	0	0	0	0
IPECACUANHA ..	per lb.	4	0	4	2
ISINGLASS, Brazil ..	"	2	2	2	9
Tongue sort ..	"	2	6	3	0
" East India ..	"	0	9	1	0
" West Indian ..	"	4	0	4	5
Russ. long staple ..	"	9	0	13	0
" inferior ..	"	0	0	0	0
" Simovia ..	"	2	0	3	0
JALAP, good ..	"	0	7	0	7
" infer. & stems ..	"	0	6	0	6
LEMON JUICE ..	per degree	0	1	0	2
LIME JUICE ..	per gall.	1	3	1	6
LIQUORICE, Spanish ..	per cwt.	0	0	55	0
" Liquorice Root ..	"	12	0	20	0
MANNA, flaky ..	per lb.	5	6	4	6
" small ..	"	1	6	1	6
MUSK, Pod ..	per oz.	16	0	13	0
" Graini ..	"	51	0	47	0
OILS (see also separate list)					
Almond, expressed ..	per lb.	1	6	1	1
Castor, 1st pale ..	"	0	4	0	4½
" second ..	"	0	3½	0	3½
Cod Liver ..	per gall.	5	6	3	6
Croton	per oz.	0	2½	0	2½
Essential Oils :					
" Almond	per lb.	20	0	25	0
" Anise-seed ..	"	7	0	10	6
" Bay	per cwt.	0	0	65	0
" Bergamot	per lb.	10	0	10	9
" Cajeput	per bottle	2	9	2	8
" Caraway	per lb.	9	0	9	0
" Cassia	"	4	2	4	4
" Cinnamon	per oz.	2	6	1	0
" Cinnamon-leaf ..	"	0	2½	0	2
" Citronello ..	"	0	1½	0	1½
" Clove	per lb.	8	6	9	6
" Juniper	"	0	0	0	0
" Lavender	per lb.	1	8	2	0
" Lemon	"				

	1876.				1875.				1876.				1875.				
	s.	d.	s.	d.	s.	d.	s.	d.	£	s.	£	s.	£	s.	£	s.	
Essential Oils, continued:—									Oils, continued:—								
Neroli	3	0	..	6	6	0	4	..	WHALE, South Sea, pale, per tun	34	10	to	35	0	34	10	
"	0	7	..	0	7½	0	7	..	yellow ..,	32	0	..	34	0	32	0	
Nutmeg	6	0	..	9	0	6	0	..	brown ..,	28	0	..	30	0	29	0	
Orange.....per lb.	13	0	..	25	0	13	0	..	East India, Fish ..,	26	0	..	0	0	24	0	
Otto of Roses.....per oz.	2	0	..	3	6	2	0	..	OLIVE, Galipoli ..per ton	45	10	..	0	0	0	0	
Patchouli	"	"	"	"	"	"	"	"	Gioja	44	10	..	0	0	42	0	
Peppermint:									Levant	0	0	..	0	0	38	0	
American ..per lb.	16	0	..	0	0	21	6	..	Mogador	0	0	..	0	0	37	10	
English	32	0	..	34	0	35	0	..	Spanish	0	0	..	0	0	38	0	
Rosemary	2	0	..	2	6	1	4	..	Sicily	0	0	..	0	0	0	0	
Sassafras	2	3	..	2	6	2	3	..	COCOANUT, Cochinchina ..,	39	0	..	40	0	0	0	
Spearmint	14	0	..	16	0	12	0	..	Ceylon ..,	37	0	..	0	0	37	10	
Thyme.....	0	0	..	0	0	1	9	..	Sydney ..,	30	0	..	36	10	30	0	
Mace, expressed ..per oz.	0	6	..	0	10	0	7½	..	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	
OPIUM, Turkey ..per lb.	19	6	..	21	6	29	0	..	WHALE, South Sea, pale, per tun	34	10	to	35	0	34	10	
inferior	9	0	..	18	0	22	0	..	yellow ..,	32	0	..	34	0	32	0	
QUASSIA(bitterwood)per ton	100	0	..	140	0	200	0	..	brown ..,	28	0	..	30	0	29	0	
RHUBARB, China, good and									East India, Fish ..,	26	0	..	0	0	24	10	
fine	per lb.	4	0	..	4	6	2	6	..	OLIVE, Galipoli ..per ton	45	10	..	0	0	0	0
Good, mid. to ord. .."	0	9	..	3	0	0	9	..	Gioja	44	10	..	0	0	42	5	
Dutch Trimmed .."	8	0	..	8	6	0	0	..	Levant	0	0	..	0	0	38	0	
ROOTS—Calmumba ..per cwt.	25	0	..	28	0	20	0	..	Mogador	0	0	..	0	0	37	10	
China	19	0	..	24	0	19	0	..	Spanish	0	0	..	0	0	38	0	
Chiretta	0	3½	..	0	4	0	4	..	Sicily	0	0	..	0	0	0	0	
Galangal.....	19	0	..	22	0	19	0	..	COCOANUT, Cochinchina ..,	39	0	..	40	0	0	0	
Gentian	23	0	..	24	0	23	0	..	Ceylon ..,	37	0	..	0	0	37	10	
Hellebore	0	0	..	0	0	30	0	..	Sydney ..,	30	0	..	36	10	30	0	
Orris	26	0	..	75	0	26	0	..	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	
Pellitory	60	0	..	64	0	38	0	..	WHALE, South Sea, pale, per tun	34	10	to	35	0	34	10	
Pink	0	0	..	0	0	0	10	..	yellow ..,	32	0	..	34	0	32	0	
Rhatany	0	4	..	0	8	0	4½	..	brown ..,	28	0	..	30	0	29	0	
Seneka	3	3	..	3	5	3	5	..	East India, Fish ..,	26	0	..	0	0	24	10	
Snake	0	6	..	0	6½	0	10	..	OLIVE, Galipoli ..per ton	45	10	..	0	0	0	0	
SAFFRON, Spanish ..	35	0	..	36	0	20	0	..	Gioja	44	10	..	0	0	22	0	
SALEP, Alicant ..per ewt.	0	0	..	0	0	0	0	..	Levant	0	0	..	0	0	0	0	
SARASPARILLA, Lima per lb.	0	6	..	0	8	0	0	..	Mogador	0	0	..	0	0	0	0	
Guayaquil	1	9	..	1	11	0	0	..	Spanish	0	0	..	0	0	0	0	
Honduras	1	3	..	1	6	1	3	..	Sicily	0	0	..	0	0	0	0	
Jamaica	2	8	..	3	0	2	4	..	COCOANUT, Cochinchina ..,	39	0	..	40	0	0	0	
SASSAFRAS ..per ewt.	0	0	..	0	0	0	0	..	Ceylon ..,	37	0	..	38	0	0	0	
SCAMMONY, Virgin ..per lb.	24	0	..	30	0	25	0	..	Sydney ..,	30	0	..	31	0	0	0	
second & ordinary .."	6	0	..	22	0	7	0	..	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	
SENNA, Bombay	0	1	..	0	4	0	1	..	WHALE, South Sea, pale, per tun	34	10	to	35	0	34	10	
Tinnivelly	0	2	..	0	3	0	1½	..	yellow ..,	32	0	..	34	0	32	0	
Alexandria	0	4½	..	2	6	0	7	..	brown ..,	28	0	..	30	0	29	0	
SPERMACETI, refined .."	1	4	..	0	0	1	4	..	East India, Fish ..,	26	0	..	0	0	24	10	
American	1	0	..	0	0	1	1	..	OLIVE, Galipoli ..per ton	45	10	..	0	0	22	0	
SQUILLS	0	2	..	0	3	0	3	..	Gioja	44	10	..	0	0	20	0	
GUMS.									1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	
AMMONIACI drop ..per cwt.	1	15	..	2	15	2	15	..	WHALE, South Sea, pale, per tun	34	10	to	35	0	34	10	
lump	1	0	..	1	12	1	6	..	yellow ..,	32	0	..	34	0	32	0	
ANMI, fine washed .."	11	0	..	12	10	11	0	..	brown ..,	28	0	..	30	0	29	0	
bold scraped .."	9	10	..	10	17/6	10	0	..	East India, Fish ..,	26	0	..	27	0	25	10	
sorts	6	10	..	9	5	5	10	..	OLIVE, Galipoli ..per ton	45	10	..	46	0	44	0	
dark	4	0	..	6	0	4	10	..	Gioja	44	10	..	45	0	43	0	
ARABIC, E.I., fino									Levant	0	0	..	0	0	0	0	
pale picked .."	2	19	..	4	0	3	0	..	Mogador	0	0	..	0	0	0	0	
srt., md. to fin. .."	2	10	..	2	18	1	13	..	Spanish	0	0	..	0	0	0	0	
garblings .."	1	1	..	2	4	0	19	..	Sicily	0	0	..	0	0	0	0	
TURKEY, piek, gd. to fin. .."	6	0	..	10	0	7	0	..	COCOANUT, Cochinchina ..,	39	0	..	40	0	38	0	
second & inf. .."	2	10	..	5	10	3	0	..	CEYLON, English per qr. ..	60	0	..	61	0	60	0	
in sorts .."	1	15	..	2	5	1	10	..	LINSEED, English per qr. ..	60	0	..	64	0	60	0	
Gedda	1	3	..	1	11	1	1	..	Black Sea & Azof ..	48	0	..	52	0	50	0	
BARBARY, white .."	2	4	..	2	16	1	10	..	Caleutta ..,	49	0	..	52	0	50	0	
brown .."	1	10	..	1	14	1	5	..	Bombay ..,	49	0	..	52	0	50	0	
AUSTRALIAN .."	1	15	..	2	5	1	14	..	St. Petrsbrg. ..,	0	0	..	0	0	0	0	
ASSAFETIDA, em. to fin .."	0	15	..	1	10	0	12	..	Mustard, brown ..per bsdl.	12	0	..	15	0	14	0	
BENJAMIN, 1st & 2nd .."	10	0	..	36	10	20	0	..	white ..,	13	0	..	16	0	15	0	
Sumatra 1st & 2nd .."	6	12/6	..	15	5	7	10	..	1876.	1875.	1876.	1875.	1876.	1875.	1876.	1875.	
3rd .."	3	9	..	5	5	3	10	..	WHALE, South Sea, pale, per tun	34	10	to	35	0	34	10	
COPAL, Angola red .."	6	0	..	6	15	5	10	..	yellow ..,	32	0	..	33	0	32	0	
Benguela .."	4	0	..	5	0	4	0	..	brown ..,	28	0	..	30	0	29	0	
Sierra Leone, per lb. .."	0	7½	..	0	11	0	8	..	East India, Fish ..,	26	0	..	27	0	26	0	
Manilla ..per ewt.	15	0	..	27	0	20	0	..	OLIVE, Galipoli ..per ton	45	10	..	46	0	45	0	
DAMMAR, pale .."	60	0	..	63	0	58	0	..	Gioja	44	10	..	45	0	44	0	
EUPHORBIUM .."	12	0	..	20	0	12	0	..	Levant	0	0	..	0	0	0	0	
GALBANUM ..per lb.	0	6	..	1	6	1	0	..	Mogador	0	0	..	0	0	0	0	
GAMBOGE, pckd, pipe per cwt.	205	0	..	260	0	185	0	..	Spanish	0	0	..	0	0	0	0	
GUAIACUM ..per lb.	1	0	..	3	2	0	6	..	Sicily	0	0	..	0	0	0	0	
KINO ..per ewt.	40	0	..	50	0												



CORRESPONDENTS will please observe that the Editor cannot undertake to send private replies to the class of queries which are answered in this page. He will be much obliged if readers will communicate items for this department as well as draw from it. All communications should give (in confidence) the name and address of the writer, though any *nom de plume* may be adopted. No query can be attended to in the current month which reaches this office after the 10th.

Mr. J. Forbes (Valparaiso).—We are unable to supply the back numbers.

Ignoramus.—He can only legally commence business as a chemist and druggist after passing (*a*) the Preliminary and (*b*) the Minor examinations. He might, however, apply to the Registrar and explain the circumstances, showing why he omitted to get on the register at the proper time.

A friend of ours who is the "discoverer" of a certain liver pill was recently honoured with the subjoined testimonial, the original of which he sends to us. "Dear Sir,—It affords me great pleasure to assert that your pills for the liver complaint (or disease) has very agreeably deceived many persons. The relief they afford baffles or supersedes the sublimest description. Being the son of Mrs. —, I know the necessity of having them (the pills) in store ready for use when attacked by that foul malady. Hoping you will have the kindness to furnish me with a box of your valuable pills by the post, I enclose stamps. Hoping you are well, I conclude.—Believe me, sir, to be yours truly, —, P. M. Local Preacher."

We have received an account of the rescue of a youth from drowning at Yarmouth by John Lee, chemist, of that town. The occurrence took place early on the morning of July 17. The youth was at least 50 yards from shore, and was sinking. Mr. Lee had great difficulty in bringing him to land.

Arthur Grant.—We find no formula for Infusum Scille, and as water will not extract its active principle we should think such a preparation would be useless. Acetum Scillæ sufficiently diluted would surely answer every reasonable purpose.

W. P.—The article you send us a specimen of is Stauni Murias (muriate of tin). You can get it from any wholesale druggist or drysalter. It is poisonous.

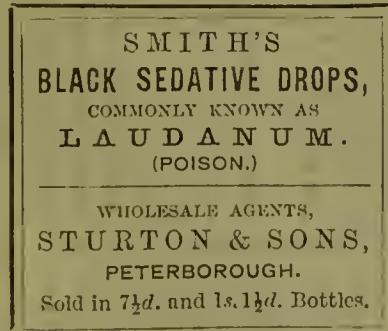
L. S.—We should judge that the proprietors of the Pain Killer have a legal right to the exclusive possession of the title. Ascertain if it is registered under the new Trade Marks Act. If it is they would make very short work of any infringement.

Aqua.—Wanklyn's "Water Analysis" (5s.), published by Tribner, will tell you all you want to know.

"Efferescens" asks, "Can anyone favour me with a formula for effervescent lozenges, similar to Cooper's?"

R. L. G.—Send to Messrs. Churchill, New Burlington Street, London, for their list. Your question is too vague as you put it to us. We have already published all the conditions necessary for students who wish to compete for the prize we offer.

W. H. P. (Bourne) sends us a label thus worded :—



This is how the Pharmacy Act is evaded in a district where large quantities of laudanum are sold. Information has been given by the superintendent of police at Bourne to the Pharmaceutical Council, but it does not appear that they have taken any steps to prevent the practice. Of course, as the law now stands they are powerless. The only remedy, therefore, remaining is for chemists to join together to help themselves. Vigorous and united action will soon settle such disgraceful

evasions of the law as is here signalled, and we have no doubt our correspondent will make one in the effort now on foot to form a strong Trade Association.

British Pharmacopœia.—Lime juice may be preserved fairly well if kept in a cool place, by the addition of 1 oz. spirit of wine to the pint. A little mucilage separates in a short time, and this may be separated by filtration. It should be kept in full bottles well corked. For syrups we should think you had better make an artificial juice in the proportion of 1½ oz. citric acid to the pint.

R. D. F.—Harness blacking.—Some preparations, the basis of which is glue, are affected by wet. A formula like the following is better:—Melt beeswax, 1 lb., with soft soap, 6 ozs. Incorporate 4 ozs. ivory black. To this add 1 oz. Prussian blue, ground in 2 ozs. linseed oil. Finally, mix with the rest ½ pt. spirit of turpentine.

J. S. T. W.—Apply to Messrs. Berger, Spence & Co., Manchester. They quote the ore at from 90s. to 100s. per ton for 70 per cent.

L. S. A.—It is desirable always to inform the Registrar of any change of address, or you risk having your name struck off the register if at any future time he should send two letters to your old address and neither of them should find you.

C. W.—The result of decomposition of syrup or liquor ferri iodidi is the evolution of free iodine, and the deposition of peroxide of iron.

J. H. Z.—The Modified examination is only available to assistants who had practised their business for at least three years, and who made application before December 31, 1869. There is no chance for any one to be so examined who omitted this formality at the proper date.

We are perpetually being asked to recommend a treatise on domestic medicine. On this point Dr. Lindsay (Perth) writes to the *British Medical Journal*:—"To those of your correspondents who have recently made inquiry concerning some trustworthy simple manual of household medicine for the use of those who have not, for the moment, access to properly qualified medical men, let me commend a little volume, published by Messrs. Thomas Nelson & Sons, of Edinburgh, in 1873, entitled a 'Handy Book of Medical Information and Advice,' by a Physician (the late Dr. Warburton Begbie, of Edinburgh), the cost being about half-a-crown."

Linseed Oil Varnish.—Boil linseed oil, 60 parts, with litharge, 2 parts, and white vitriol, 1 part, each finely powdered, until all water is evaporated. Then set by. Or, rub up borate of manganese, 4 parts, with some of the oil, then add linseed oil, 3,000 parts, and heat to boiling.

To make a handy paint, break an egg into a dish and beat lightly. Use the white only if for white paint; then stir in colouring matter to suit. Red lead makes a good red paint. To thin it, use a little skinned milk. Eggs that are a little too old to eat will do for this very well.

M. S.—Waterproof glue may be made by boiling one pound of common glue in two quarts of skinned milk. This withstands the action of the weather.

The following specimen of English, pure and undefiled, is from the *Liverpool Times*:—"A doctor was lately summoned to a cottage at Harwood, in Teasdale, and found a boy in need of his services. 'Put out your tongue,' said the doctor. The boy stared like an owl. 'My good boy,' requested the medical man, 'let me see your tongue.' 'Talk English, doctor,' said the mother; and then, turning to her son, she said:—'Hoppen thy gobbler, and put out thy lolliker.' The boy rolled out his tongue in a moment."

Toothache Remedy.—The correspondent of a foreign medical journal says:—"I have found collodion mixed with enough carbolic acid to form a jelly-like mass to be an excellent remedy for toothache. About equal parts will form a 'stiff' jelly, which may be taken on the end of a pine stick and placed in the cavity of the aching tooth. The pain will be relieved almost instantly if it depends on an exposed nerve. I have found this the most reliable and convenient remedy I ever tried."

Worm Doctor.—Dr. Burton, in the *Lancet*, recently recommended for the treatment of tapeworm:—1. A preliminary starvation of twenty-four hours. 2. The administration of a combination of kalmia and male fern, namely, two drachms of kalmia to be rubbed up with a little gum and water till an emulsion is formed, and then two drachms of oil of male fern to be added, and the whole triturated in a mortar with a gradual addition of water till a three-ounce mixture is formed, of which half is to be given at bed time, and the remainder four hours later. He had never known this to fail where the drugs were of proper quality.

Our next issue—September 15—will contain full information concerning medical, pharmaceutical, and scientific education in the United Kingdom. We shall also present a complete report of the meetings at Glasgow, of the Pharmaceutical Conference, and the Trade Association. We especially recommend this occasion for the advertisement of scientific works, apparatus, and educational arrangements.